ViewCast®

# Niagara® SCX Guide

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# About This Guide

This ViewCast Niagara® SCX Guide provides set up and configuration information for anyone who uses or administers the Niagara SCX client software. Users should have a basic technical understanding of their media-encoding environment and some basic experience with streaming media principles and practices. Users should also understand and use Microsoft® Windows.

## Conventions for this guide

This guide uses the following document conventions to help you identify different types of information.

| Convention | Description | Example |
|---|---|---|
| **Bold Text** | Characters to enter when referenced in a procedure. The name of fields or keys to press. | Enter **DTMF** as the group type. Press **Enter** to save all your changes. |
| *Note:* | Provides supplemental information. | *Note: The prompt may not display if …* |
| *IMPORTANT!* | Provides important data that does affect how the system or software responds. | *IMPORTANT! You must install Niagara SCX prior to configuring SCX options…* |
| *CAUTION!* | Provides information to help avoid possible damage to hardware or a system crash (without data loss). | *CAUTION! Use case sensitive commands to keep from destroying…* |
| *WARNING!* | Provides information to ensure that you avoid potential injury, death, or permanent system damage. | *WARNING! Do not touch exposed wires.* |

# Welcome to Niagara SCX

The exclusive ViewCast Niagara SCX streaming media management software supports Adobe Flash® dynamic and Apple® HTTP live (iPhone® and iPad® mobile digital devices), Adobe Flash H.264, MPEG-4, H.264, H.263, and Windows Media® (Silverlight™) as well as 3GPP/3GPP2, MP4 container support. It provides an optimal method for managing live video broadcasting over the Internet and to mobile devices. It allows you to set up, monitor, and control remote or distributed Niagara SCX streaming encoder systems positioned throughout your enterprise or anywhere in the world – all from your desktop. Niagara SCX is included on all ViewCast encoding systems.

This manual focuses on the Niagara SCX client interface. For information on the web interface, see the specific product manual or the product quick start guide.

*Note: Niagara SCX features vary between Niagara models.*

## System features

- This software version is pre-installed and available only on certain ViewCast encoding systems.
- Integrated segmenting
- Adaptive bit-rate encoding
- Support for CN authentication protocols
- Built-in AES-128 encryption
- Full control of encoding parameters
  - *Video and audio input selection*
  - *Encoder profile/target audience*
  - *Video resolution and format*
  - *Stream destination and port*
  - *Video and audio attributes*
- Input/output preview
- Vectorscope/waveform display for end-to-end color accuracy
- Encoder statistics monitoring:
  - *Frame rate, bit rate*
  - *CPU load*
  - *Audio level*
- Application integration via XML
- Real-time capture and compression from a live video source

- Support for NTSC, PAL, wide screen, CIF, QCIF, SECAM, and all popular resolutions in addition to custom user-defined picture dimensions
- Support for all widely used bit rates, from 16 kb/s to 4 Mb/s +…

You can instantly view the status of all of your networked encoders and active encoder sessions, as well as control and monitor each individual stream.

*Appendix A: An Introduction to Streaming Media* provides a complete overview on streaming audio and video over an IP network. Access http://viewcast.com/support/resourcecenter for more information about streaming media.

# Quick Start

A quick start for Niagara SCX includes configuring the environment then starting and using Niagara SCX.

## Setting up Niagara SCX environment

**To set up the Niagara SCX environment:**

1. Open Niagara SCX Explorer on the ViewCast encoding system you plan to control. You may use a remote desktop to connect to the encoding system.
2. To connect to the Niagara SCX Client, double-click the Niagara SCX shortcut from the encoding system desktop.

**Figure 1. Niagara SCX Desktop Shortcut**

3. Ensure the server and the remote workstation have visibility to each other.
   *Note: The default user name is* Niagara *and the password is* password.

## Beginning to encode

**To begin encoding**:

1. Start Niagara SCX or verify the service started.
2. Insert the desired encoder type you wish to run on the server or on the toolbar, click **Insert** then **Encoder**.
   The system displays the New Encoder dialog box.
   Choose any of the following:
   - Adaptive
   - Flash Video
   - Windows Media Encoder
   - MPEG-4
   - AVI Capture

   *Note: The Adaptive encoder has limited functionality in the client interface. ViewCast reconnects using the web interface to set up adaptive profiles.*
3. Enter a name to identify the encoder and press **Enter**. The system displays the name in the **Codec Name** field in the **General Properties** area of the **Auto/Name** tab.
   *Note: Encoder types vary on each appliance.*

4. Repeat steps 2 and 3 for each encoder. You can start and stop the encoders on an *as-needed* basis.
5. Click the **Video** and **Audio** input source for the encoder from the drop-down box on the Input tab.

   *Note: This field may also include a file you need to convert to a streaming format.*
6. Configure the video and audio settings, if needed, on the Video Settings and Audio Settings tab.
7. Click either **Enable Streaming** to begin streaming or **Save to File** on the Output tab.

   *Note: Windows Media encoder has only one Output tab. It contains both the target audience and information for saving the video to a file.*
8. Enter the author and copyright information on the Author Info tab under the streaming options for the encoder if necessary.
9. Ensure **Enable SimulStream** is selected on the Filters tab.
10. Click the View tab under streaming options to preview the video.

    *Note: Steps 9 and 10 are optional.*
11. Click **Start** on the Operations tab to begin encoding.

    *Note: Click **Streaming Options** to view statistics for the encoding session. Click the various tabs to see data about the encoding session.*

# Niagara SCX and Explorer Basics

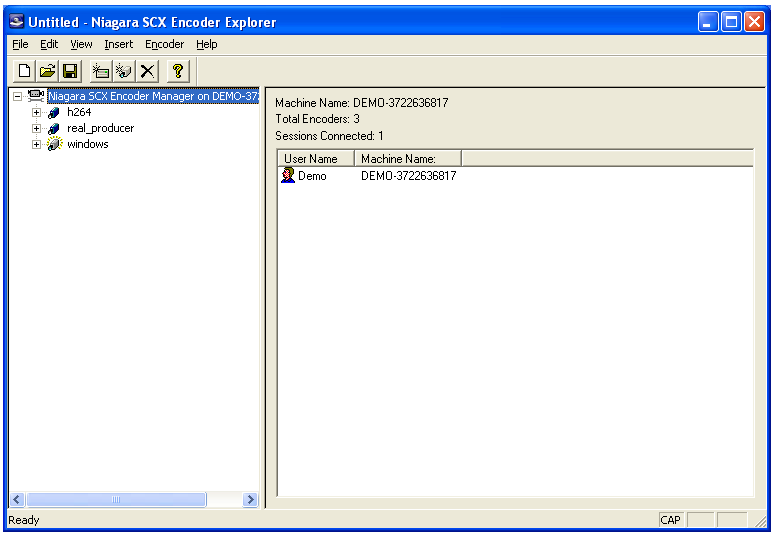
This section explores the basics of the SCX service and application. It includes the following topics:

- Niagara SCX window design
  - *Toolbar*
  - *Menu bar*
  - *Creating a new Niagara SCX view*
- Creating a new Niagara SCX Explorer connection
- Encoder menu
- Help menu
- Stopping the Niagara SCX Explorer

## Niagara SCX window design

The Niagara SCX  functions like Windows Explorer. The left panel of the Niagara SCX Encoder Explorer window (Figure 2) displays your Niagara SCX Encoder Manager and associated encoders. When you select an encoder, its corresponding properties display on the right.

**Figure 2. Niagara SCX Encoder Explorer**



# Toolbar

The Niagara SCX toolbar (Figure 3) contains the most frequently used commands in the application. This guide details and explains each command in later sections. On the application, click each of the buttons to learn more on how to use them. The toolbar also lists the same commands on the Niagara SCX menu bar.

**Figure 3. Niagara SCX Explorer toolbar**

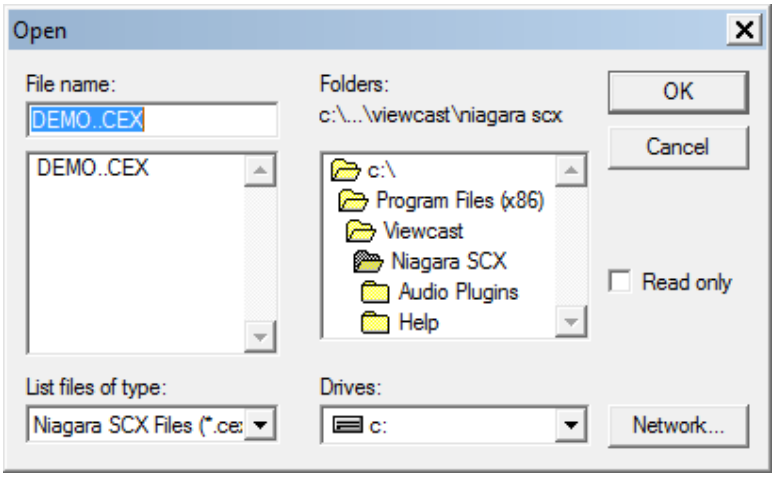
| | |
|---|---|
| **A** | Group and save different SCX views. |
| **B** | Connect to the existing Niagara SCX encoder. |
| **C** | • Save any SCX encoder combination you put in Niagara SCX to the existing location using the current name.<br>• Save many different encoder combinations with unique names. |
| **D** | The system opens a prompt for you to enter the computer name or IP address and connect to a system running Niagara SCX. |
| **E** | • Add a new or different encoder. Options may include:<br>— Adaptive<br>— AVI<br>— Flash<br>— Windows Media<br>— MPEG4 |
| **F** | Delete an encoder connection from Niagara SCX. |
| **G** | Copy of the Niagara SCX User Guide. |

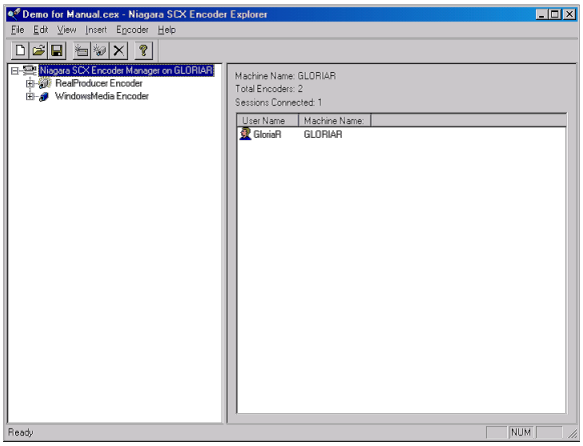
# Menu bar

The Menu bar contains some commands not available on the Niagara SCX toolbar.

## File menu

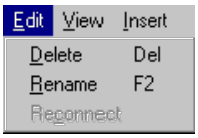
**Figure 4. File menu commands**

| | |
|---|---|
| **New** | • Create a new Niagara SCX Encoder Manager connection.<br>• Group and save different SCX views for monitoring the status of the encoder. |
| **Open** | Connect to and use the existing Niagara SCX encoder. This command displays the **Open** window (Figure 5).<br>**Figure 5. Open window**<br>  <br><br>Select the file you want to open; click **Open**. The system displays the **Niagara SCX Encoder Explorer** window (Figure 6).<br>*Note: Appliances using Windows XP or other operating systems may have different windows.* |

| | |
|---|---|
| | **Figure 6. Niagara SCX Encoder Explorer**<br>  <br><br>*Note: The previously saved configuration automatically opens when Niagara SCX launches.* |
| **Save** | • Save any SCX encoder combination you put in Niagara SCX to the existing location using the current name.<br>• Save many different encoder combinations with unique names. |
| **Save As** | Save changes to an existing encoder and apply a different name. |
| **Recent File** | The system stores and displays your last four saved encoders thereby allowing you to load a Niagara SCX encoder quickly. |
| **Exit** | Exits Niagara SCX. |

# Edit menu

**Figure 7. Edit menu commands**




| | |
|---|---|
| **Delete** | Delete an encoder connection from Niagara SCX. |
| **Rename** | Rename the encoder connection. |
| **Reconnect** | Reconnect to Niagara SCX. This command is useful when you stop the Niagara SCX service and start it again while running Niagara SCX Explorer. |

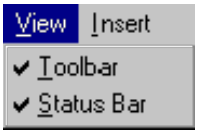
*Note: When you launch Niagara SCX Explorer, it may appear unresponsive if Niagara SCX becomes unavailable for any reason.*

*Wait a minute for the application to become available and the system to flag the unresponsive Niagara SCX.*

*You can also delete, rename, or reconnect to Niagara SCX by clicking the specific item, right-click, and select **Delete**, **Rename**, or **Reconnect**.*

# View menu

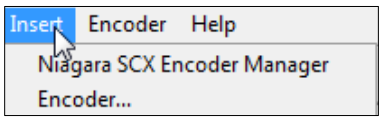
**Figure 8. View menu commands**




| | |
|---|---|
| **Toolbar** | View the toolbar on the SCX window. You must click this option. |
| **Status Bar** | View the status bar on the SCX window. You must click this option. |

# Insert menu

**Figure 9. Insert menu commands**




| | |
|---|---|
| Niagara SCX Encoder Manager | Select the encoder system. |
| Encoder | Insert a new encoder. |

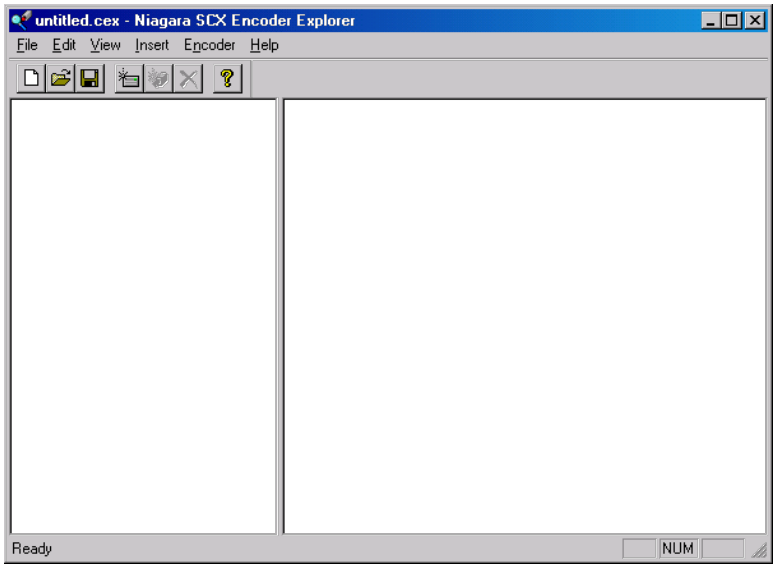
# Creating a new Niagara SCX Explorer connection

Niagara SCX Explorer allows you to save and view an encoder. You save time by recalling a saved view.

**To create a new Niagara SCX Explorer connection**:

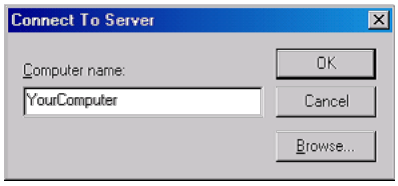
1. Click **File** ➢ **New**. The **Niagara SCX Explorer** window displays (Figure 10).

**Figure 10. Niagara SCX Explorer**




2. Click **Insert**.
3. Click Niagara SCX Encoder Manager.
4. Confirm the computer name listed or use **Browse** to locate your computer name when the **Connect To Server** window (Figure 11) displays.

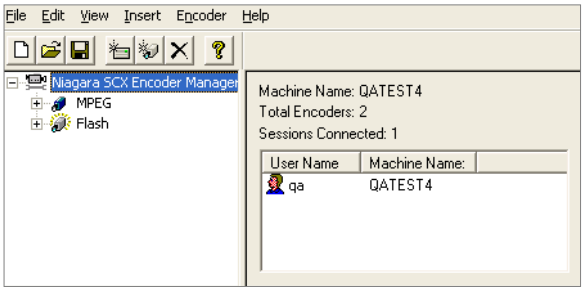
**Figure 11. Connect To Server**




5. Click **OK**.
6. Click **Insert** ➢ **Niagara SCX Encoder Manager**.

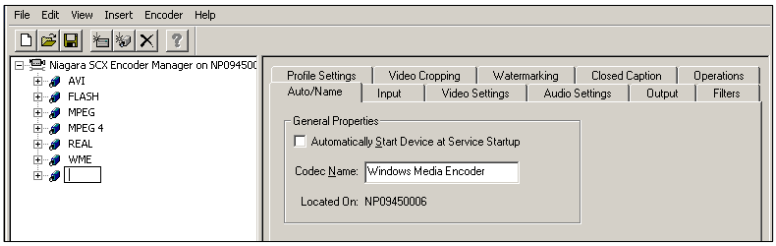
7. A window displays (Figure 12) with the Niagara SCX Encoder Manager you inserted.

**Figure 12. Niagara SCX Encoder Insert Selection**




8. To insert encoders, click **Insert ➢ Encoder...**. The **New Encoder** dialog box displays.
9. Click on the encoder from the drop-down menu and click **OK**. The encoder with the default name **New Encoder** highlighted displays. The tab changes to **Auto/Name**.
10. Rename the encoder for easy identification (Figure 13) and press **Enter**. The new name displays in the **Codec Name** field on the **Auto/Name** tab.

**Figure 13. Name Encoder**




11. Repeat the process to insert multiple encoders.
12. When you finish inserting all the encoders, click **File ➢ Save As** and enter a file name for the new combination of Niagara SCX and encoders.
13. Click **Save**.

# Inserting a new encoder

**To insert a new encoder**:

1. Go to the **Insert** menu and select **Encoder**. The system displays the **New Encoder** dialog box (Figure 14).

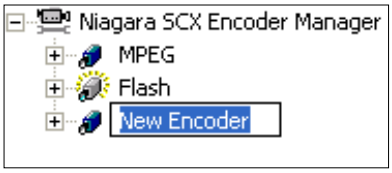
   **Figure 14. New Encoder**

   *Note: You can alternately insert an encoder by clicking on the Encoder toolbar element; or clicking the encoder, right clicking, and clicking* ***Insert a New Encoder****.*

2. Click the encoder type you want to add from the **Encoder** drop-down list. Click **OK**.
3. Click **OK** to save the encoder you want to connect. If you do not want to save the encoder, click **Cancel**.
   The new encoder with the default name **New Encoder** highlighted displays. The tab changes to **Auto/Name**.

   **Figure 15. New Encoder Display**

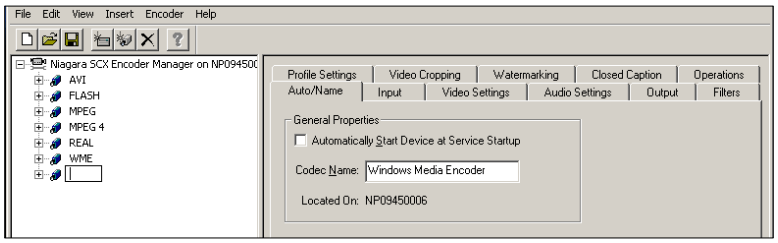
   
   

4. Type a name for the encoder such as *Encoder 1* or *Main Auditorium*.
5. Press **Enter** to save the name change.
6. Repeat the above steps for any additional encoders installed on this sever.

# Sample encoder views

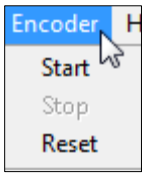
Figure 16 provides a sample of the Manual.cex view combination with six complete encoders and one encoder being added.

**Figure 16. Sample encoder view (six encoders+add encoder)**



# Encoder menu

**Figure 17. Encoder menu commands**




| | |
|---|---|
| Start | Start an encoder |
| Stop | Stop an encoder |
| Reset | Reset an encoder |

## Starting an encoder

**To start an encoder:**

1. Click on the encoder in the left side of the Niagara SCX Encoder Explorer window.
2. Click the **Encoder** menu.
3. Click **Start**. The system starts the encoder.

   *Note: You can also start an encoder by selecting the encoder, right-clicking, and selecting **Start Encoder**.*

## Stopping an encoder

**To stop an encoder:**

1. Click on the encoder in the left side of the Niagara SCX Encoder Explorer window.
2. Click the **Encoder** menu.
3. Click **Stop**. The encoder stops.

   *Note: You can also stop an encoder by clicking the right-mouse button and selecting **Stop Encoder** while you have the specific item selected.*

## Resetting an encoder

Resetting an encoder is equivalent to stopping and starting the encoder.

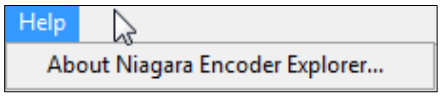
**To reset an encoder:**

1. Click on the encoder in the left side of the Niagara SCX Encoder Explorer window.
2. Click the **Encoder** menu.
3. Click **Reset.** The encoder resets.

   *Note: You can also restart an encoder by clicking the right-mouse button and selecting **Restart Encoder** while you have the specific item selected.*

# Help menu

**Figure 18. Help menu**




**Menu bar help commands**

- **About Niagara Encoder Explorer** - View information about the installed Niagara SCX software (including version release)

# Stopping the Niagara SCX Explorer

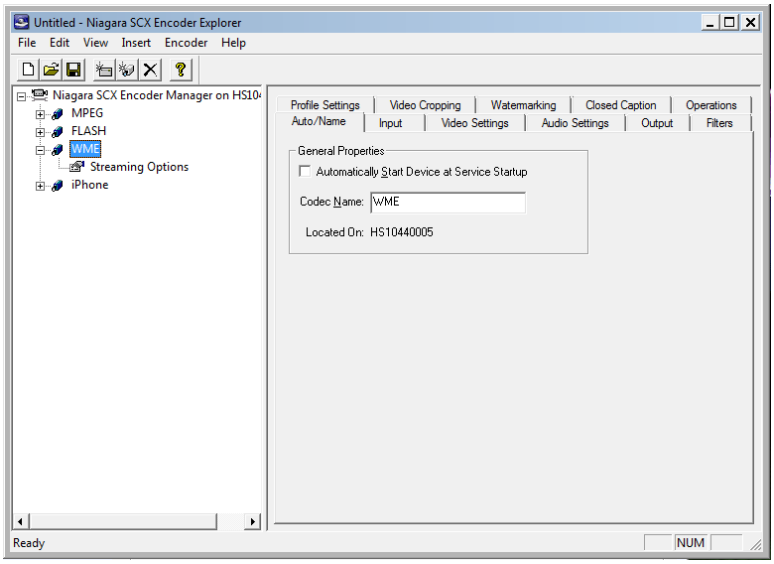
Once you configure all the necessary settings, you may exit the Niagara SCX Explorer application by selecting **File** ➢ **Exit**. You may also click the exit icon ( ) in the upper right of the window.

# Windows Media Options and Settings

When using Windows® Media as the encoding option, encoder and streaming options tabs are available.

## Auto/Name tab

**Figure 19. Auto/Name tab**



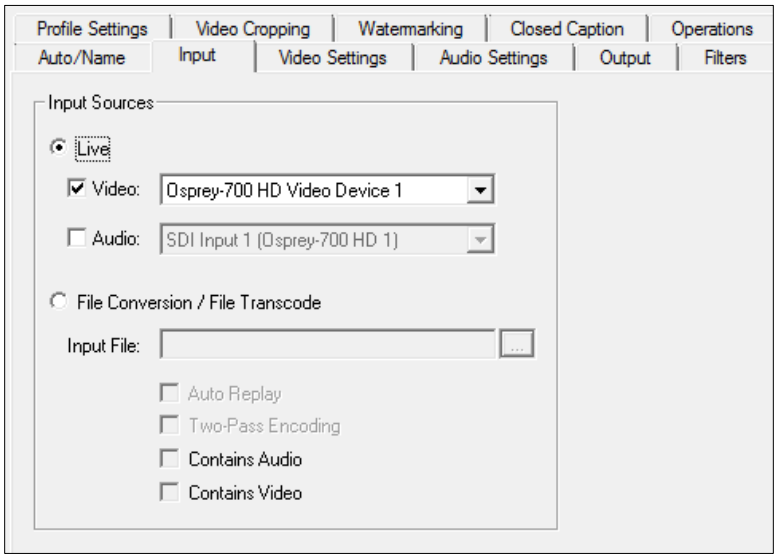

The Auto/Name tab has the following controls.

| | |
|---|---|
| Automatically Start Device at Service Startup | Enable this field to start the encoder when the Niagara SCX service starts. |
| Codec Name | Enter the name of the encoder. |
| Located On | Indicates the name of the machine where the encoder resides. |

# Input tab

Use the Input tab (Figure 20) to set the input sources to use for Live or File Conversion/File Transcode encoding.

**Figure 20. Input tab**




**To set a live input source:**

1. Click **Live**.
2. Click the video capture device from the drop-down list in the **Video** field.
3. Click the audio device from the drop-down list in the **Audio** field for live encoding.
   *Note: The system lists all known video and audio devices in the drop-down menus.*

**To set file conversion:**

1. Click **File Conversion/File Transcode** to encode a previously recorded file (such as .avi or .wav files) into streaming format.
2. Click on the browse button at the end of **Input File** to browse for a file name to insert. The Open window displays.

   *IMPORTANT! When Niagara SCX and SCX Explorer reside on different computers, always start your browse for files by clicking Network. Then work down or enter the entire file pathname beginning with the system name (such as \\fileserver\c\videos).*

   *If you simply enter a file name, you may inadvertently browse your local computer when the media file resides on the remote computer.*

   *Note: Remember the file name applies to the encoder system and not the system currently running SCX Explorer.*
3. Select **Auto Replay** to replay the file automatically.
4. Select **Two-Pass Encoding** to encode video into another format using multiple

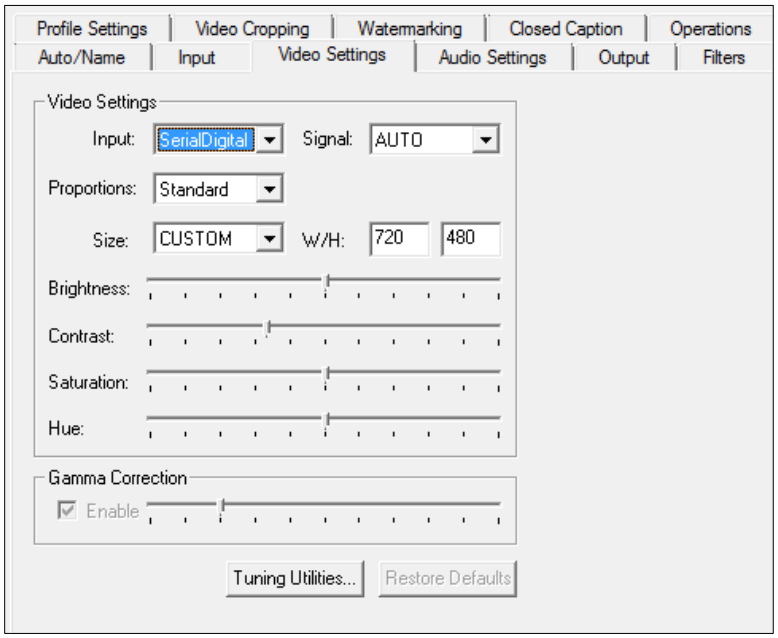
passes to keep the best quality.

5. Select **Contains Audio** to indicate if the input file contains audio.
6. Select **Contains Video** to indicate if the input file contains video.

# Video Settings tab

Use the Video Settings tab (Figure 21) to control the capture properties for the selected video device.

**Figure 21. Video Settings tab**



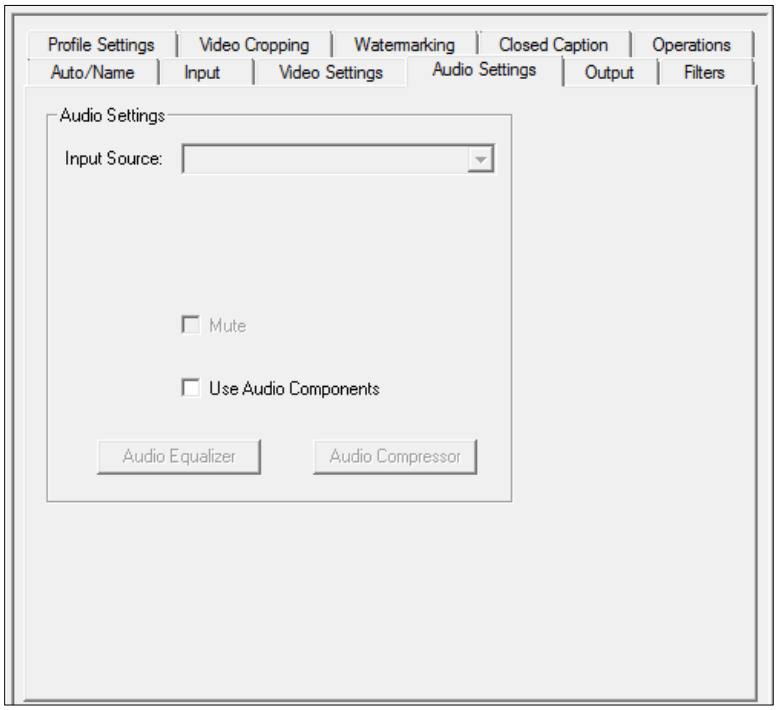

The Video Settings tab has the following controls.

| | |
|---|---|
| **Input** | Select the input connectors available for the capture device from the drop-down list. |
| **Signal** | Select the video standards the capture device supports from the drop-down list. |
| **Proportions, Size, W/H** | Use these fields to adjust capture properties such as proportion, video size, and width/height. |
| **Brightness, Contrast, Saturation, Hue** | Drag the slider to adjust additional capture properties. When making such adjustments, verify your adjustments apply to the selected input. Otherwise, your adjustments apply to all the input sources listed.<br>*Note: The capture properties remain available regardless of whether the encoder starts or remains idle.* |
| **Gamma Correction** | Adjust the gamma of the incoming video. See *Gamma Correction* for more information. |
| **Tuning Utilities** | Click **Tuning Utilities** to access tuning utilities for a selected card. Refer to *Tuning Utilities* for additional diagnostics information. |
| **Restore Defaults** | Click **Restore Defaults** to restore the system to the factory defaults. |

# Audio Settings tab

You no longer use the Audio Settings tab (Figure 22) to set the input source. Use the web interface for your Niagara system to set the input source for the selected audio devices.

**Figure 22. Audio Settings tab**

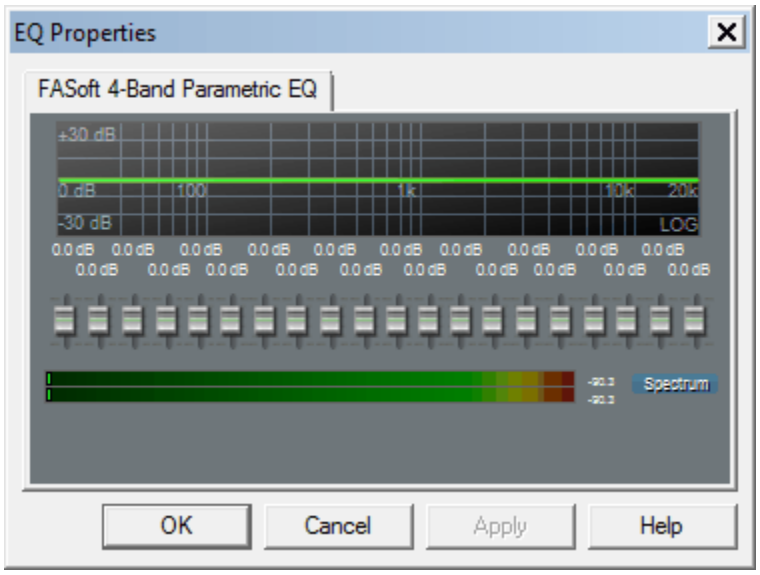



The Audio Settings tab has the following controls.

| | |
|---|---|
| **Input Source** | This field is not functional. |
| **Use Audio Components** | Select this field to enable the Audio Equalizer and Audio Compressor buttons. |
| **Audio Equalizer** | Click this button to display the EQ Properties window (see EQ Properties window). |
| **Audio Compressor** | Click on this button to display the Compressor Properties window (see *Compressor Properties window*). |

# EQ Properties window

**Figure 23. EQ Properties window**



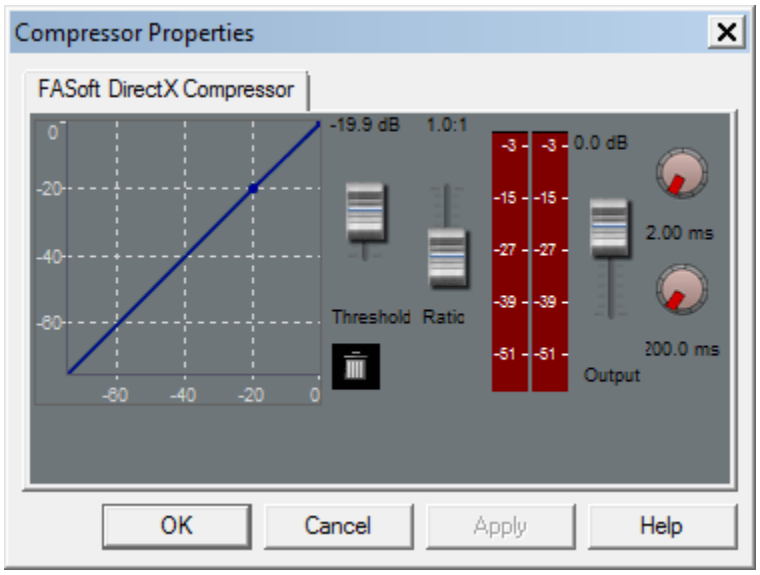

**To adjust the audio equalizer:**

1. Click on a band and slide it up or down to adjust the boost/cut at the specific frequency.
2. Click **OK** or **Apply** to set your changes.

   *Note: Click **Cancel** to cancel your changes and close the window.*
   *Click **Help** to access the user guide.*
3. Click on the graph to change the equalizer graph properties.

# Compressor Properties window

**Figure 24. Compressor Properties window**



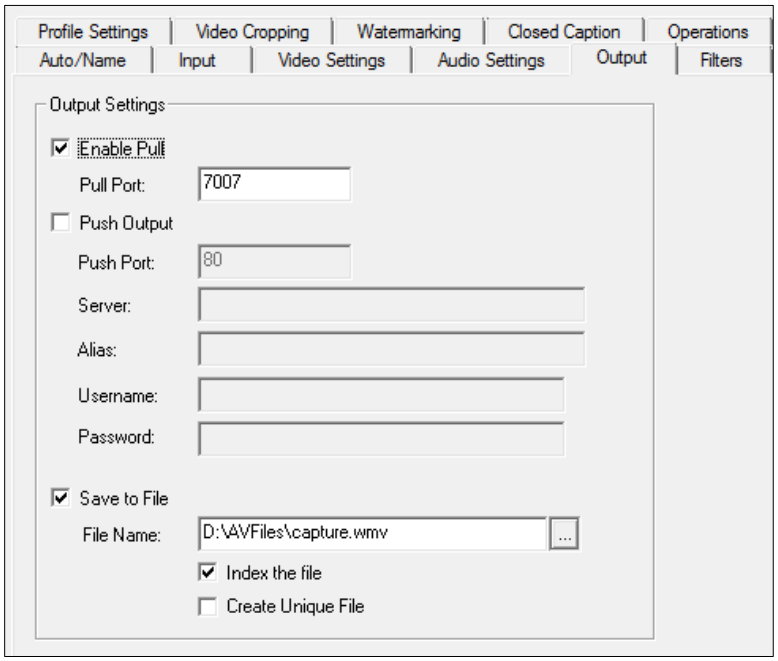

The Compressor Properties window has the following controls.

| | |
|---|---|
| **Dynamics graph plot** | Displays the settings as you adjust them. |
| **Threshold slider** | Click on the button and push up or down to adjust the threshold. |
| **Reset icon** | Click this icon to reset the dynamics graph plot |
| **Compression Ratio slider** | Click on this button and push up or down to adjust the compression. |
| **Output gain** | Click this button and push up or down to adjust the output. |
| **Attack time** | This clock indicates the attack time in milliseconds for the time it takes for the gain to increase by the output gain amount. |
| **Release time** | This clock indicates the release time in milliseconds for the time it takes for the gain to decrease by the output gain amount. |

# Output tab

Use the Output tab (Figure 25) to indicate if you want to pull or push the stream and provide a port number.

**Figure 25. Output tab**




The Output tab has the following controls.

| | |
|---|---|
| **Enable Pull** | Select this field to have Windows Media Server request the stream.<br>*Note: This method does not provide a secure connection to the server. Only use this method if the encoder and server reside within the same network firewall.* |
| **Pull Port** | Enter a port number the server will use to pull the stream. |
| **Push Output** | Select this field to maintain a secure connection to Windows Media Server. |
| **Push Port** | Enter a port number the server will use to push the stream. |
| **Server** | Enter the server name or IP address. |
| **Alias** | Enter the alias (optional). |
| **Username** | Enter the user name. |
| **Password** | Enter the password. |
| **Save to File** | Click **Save to file** if you want to save the content to a file.<br>*Note: Remember the encoder system references the file name and not the system running SCX Explorer.* |

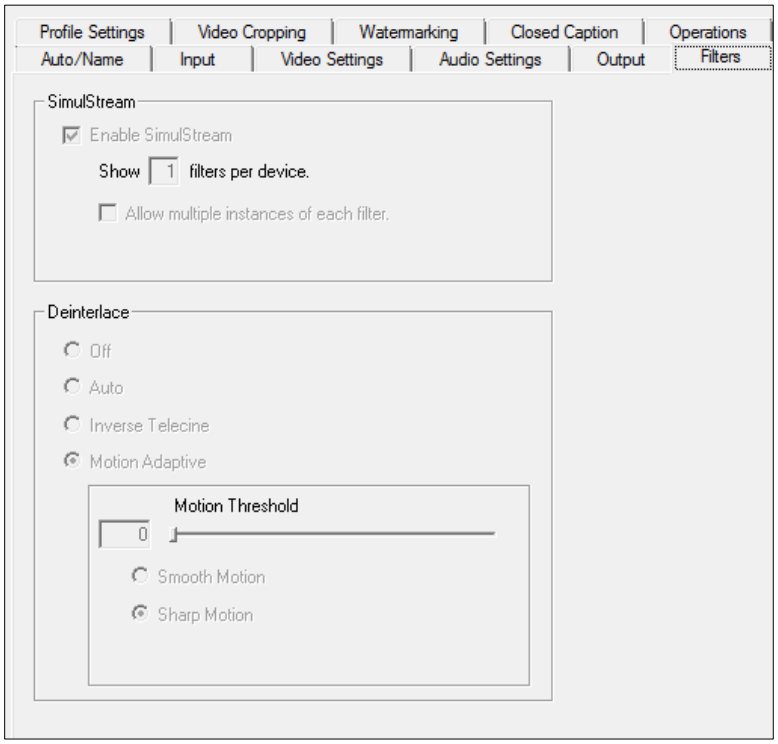
| | |
|---|---|
| **File Name** | Click on the browse button at the end of the field to search for a file name.<br>*IMPORTANT! When Niagara SCX and SCX Explorer reside on different computers, always start your browse for files by clicking Network. Then work down or enter the entire file pathname beginning with the system name (such as \\fileserver\c\videos).*<br><br>*If you simply enter a file name, you may inadvertently browse your local computer when the media file resides on the remote computer.* |
| **Index the file** | Select this field to index your video capture. |
| **Create Unique File** | Select this field to create a file that the system does not overwrite. |

# Filters tab

Use the Filters tab to enable SimulStream and deinterlacing (Figure 26). See *Filters* for more information.

*Note: This tab is optional. Refer to* Tuning Utilities *for more diagnostics information.*

**Figure 26. Filters tab**




The Filters tab has the following controls.

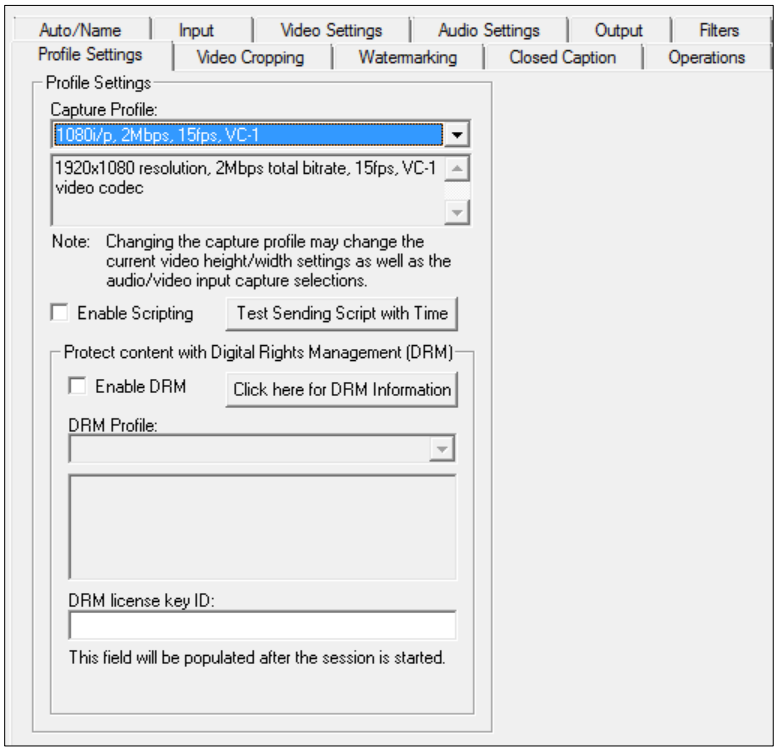
| | |
|---|---|
| **Enable SimulStream** | Select SimulStream. |
| **Show X filters per device** | Specify how many filters you plan to expose. |
| **Allow multiple instances of each filter** | Select this field to allow multiple video capture streams. |
| **Off** | Perform no deinterlacing of any kind. |
| **Auto** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Apply motion adaptive deinterlacing to video that is not telecine.<br>• Switch dynamically between the two modes as the content changes.<br>*Note: Available for NTSC video only.* |

| | |
|---|---|
| **Inverse Telecine** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Perform no deinterlacing of video that is not telecine.<br>*Note: Available for NTSC video only*. |
| **Motion Adaptive** | Apply motion adaptive deinterlacing to video. |
| **Motion Threshold** | The Motion Threshold slider and edit box adjust the threshold of difference from spatially and temporally related pixels that are in motion. As you move the slider to the left, the number of motion pixels greatly increases until nearly the entire screen is in motion. The recommended default is 16. |
| **Smooth Motion** | The Smooth Motion option results in more loss of detail in motion areas, but edges are smoother. This algorithm uses a bit more CPU. |
| **Sharp Motion** | The Sharp Motion option makes detail in motion areas sharper, but at the expense of somewhat jagged diagonal edges. |

# Profile Settings tab

The Profile Settings tab provides options for the **Profile Settings**, such as **Capture Profile**, and settings for **Digital Rights Management** (Figure 27).

**Figure 27. Profile Settings tab**



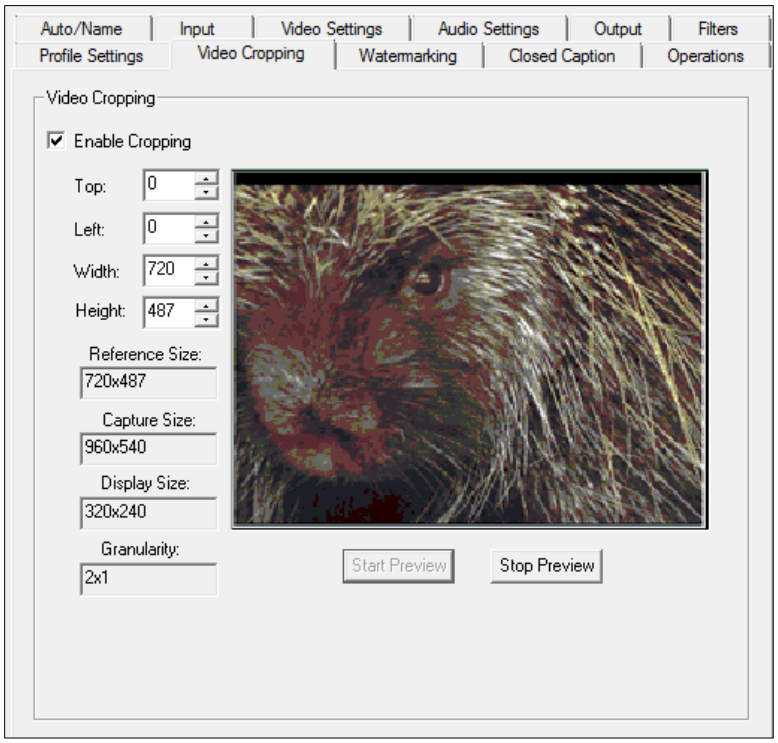

The Profile Settings tab has the following controls

| | |
|---|---|
| **Capture Profile** | Select the capture profile from the drop-down list.<br>*Note: Changing the capture profile may change the current video height/width settings as well as the audio/video input capture selections.* |
| **Enable Scripting** | Select this field to enable closed captions |
| **Test Sending Script with Time** | Select this field to send a test script with time. |
| **Protect content with Digital Rights Management (DRM)** | The system allows the **Enable DRM** check box to give DRM protection for this encoder if you imported a **DRM Profile** (see *DRM for Windows Media*). |

# Video Cropping tab

Use the Video Cropping tab to set the size and aspect ratio of chosen video output (Figure 28).

**Figure 28. Video Cropping tab**



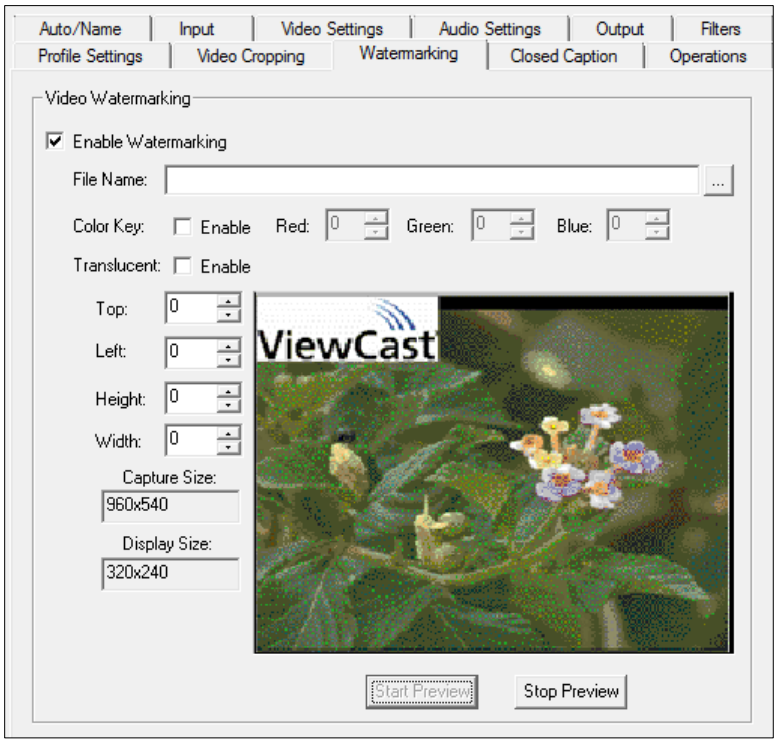

The Video Cropping tab has the following controls.

| | |
|---|---|
| **Enable Cropping** | When you enable cropping, the system automatically switches the video size to FULL and the cropping measurements default to the FULL size.<br>From the **Top**, **Left**, **Width**, and **Height** settings, you can set a custom cropping size. |
| **Reference Size**<br>**Capture Size**<br>**Display Size**<br>**Granularity** | These fields refer to the size of the video. |
| **Start Preview** | Click this button to preview the video with your crop settings. |
| **Stop Preview** | Click this button to stop the preview. |

# Watermarking tab

Use the Watermarking tab (Figure 29) to place a watermarked graphic over your video output.

**Figure 29. Watermarking tab**



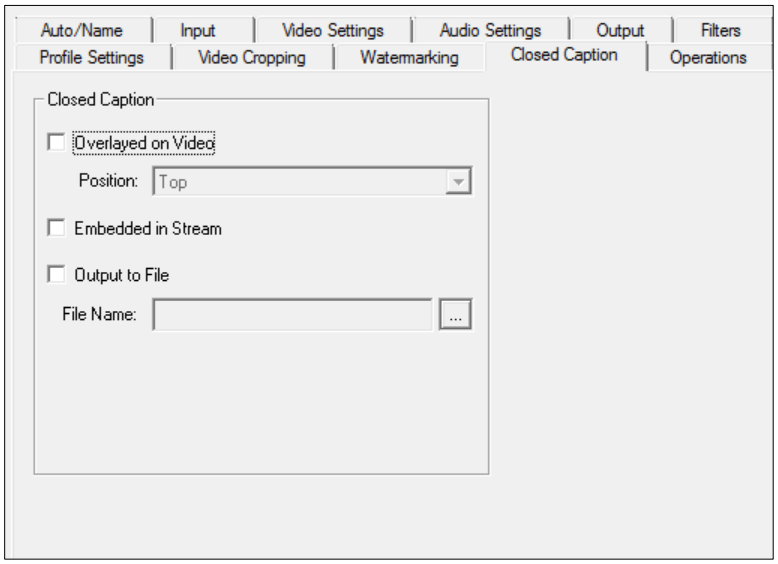

The Watermark tab has the following controls.

| | |
|---|---|
| **Enable Watermarking** | Select this field to place a watermarked graphic over your video output.<br>*Note: You can only watermark a 24-bit bmp. The system does not accept any other image formats.* |
| **File Name** | Click on the browse button at the end of the field to search for a file name of the graphic you want to use. |
| **Color Key** | Select this field to adjust the color balance, size, and opacity of the graphic. |
| **Translucent** | Select this field to render the graphic translucent. |
| **Top**<br>**Left**<br>**Height**<br>**Width** | Use these controls to adjust the location of the graphic. |
| **Capture Size** | Indicates the size of the capture. |
| **Display Size** | Indicates the size of the display. |
| **Start Preview** | Click this button to preview the watermark on the video. |
| **Stop Preview** | Click this button stop the preview. |

# Closed Caption tab

Use the Closed Caption tab (Figure 30) to adjust the positioning of closed caption text if applicable, on your video feed.

**Figure 30. Closed Caption tab**

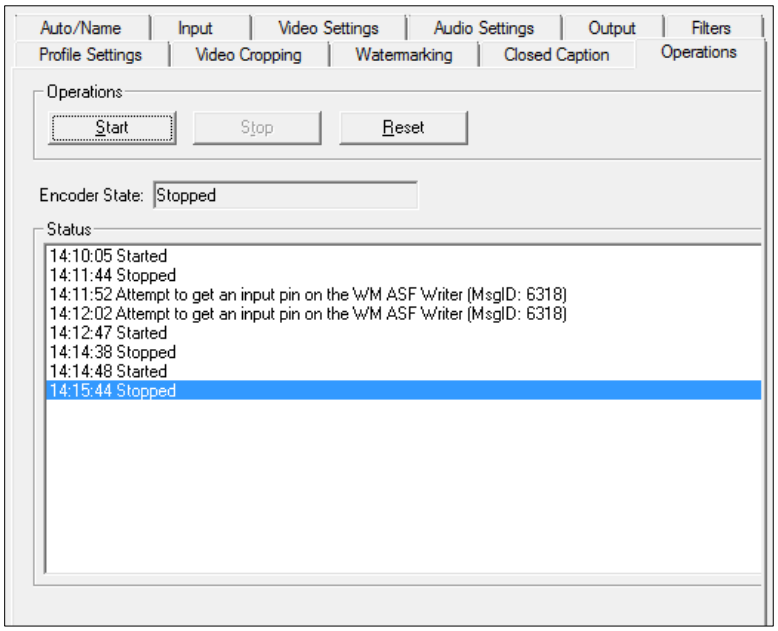



The Closed Caption tab has the following controls.

| | |
|---|---|
| **Overlayed on Video** | Select this field to overlay the closed caption text on the video stream. |
| **Position** | Select the position of the closed caption text from the drop-down list. |
| **Embedded in Stream** | Select this field to embed the text so it displays in a specialized space below the video display in Windows Media Player. |
| **Output to File** | Select this field to capture the closed caption text into a SAMI file. |
| **File Name** | Click the browse button at the end of the field to search for a file name.<br>*Note: The SAMI field path you enter must include a shared directory, partition, or drive.* |

# Operations tab

**Figure 31. Operations tab**




The Operations tab has the following controls.

| | |
|---|---|
| **Start** | Click this button to begin encoding. |
| **Stop** | Click this button to end the session. |
| **Reset** | Click this button to stop the restart an encoding session. |
| **Encoder State** | Indicates the status of the encoder (started, stopped). |
| **Status** | A progress report and error messages appear in the Status section of this window. |

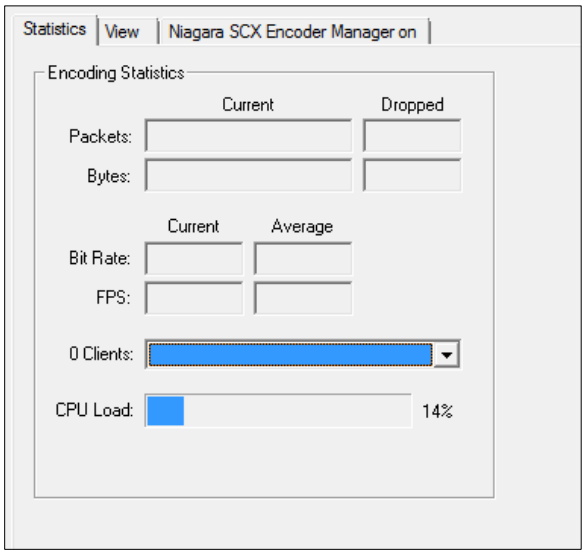
# Windows Media streaming options tabs

The Windows Media streaming options tabs include Statistics, View, and Niagara SCX Encoder Manager on tabs.

## Statistics tab

Use the Statistics tab (Figure 32) to view the current encoder status.

**Figure 32. Statistics tab**




The Statistics tab has the following controls.

| | |
|---|---|
| **Current** | The Current column displays the cumulative packets and bytes transferred since the encoder started. |
| **Dropped** | The Dropped column displays the number of dropped packets/bytes. |
| **Current**<br>**Average** | The Current and Average columns displays the bit rate and frame per second. |
| **Clients** | The Clients drop-down box displays the devices currently receiving the stream from the encoder, including media players and servers. |
| **CPU Load** | The current system CPU load and audio level. |

# View tab

You can monitor the output of the encoder on the View tab. To watch the incoming video or see the output video standards, you must have enabled Osprey® SimulStream® for the capture. Osprey SimulStream lets a single card produce multiple outputs. For more information or to purchase SimulStream for your Osprey capture card, visit http://viewcast.com/products/software/simulstream.

**Figure 33. View tab**

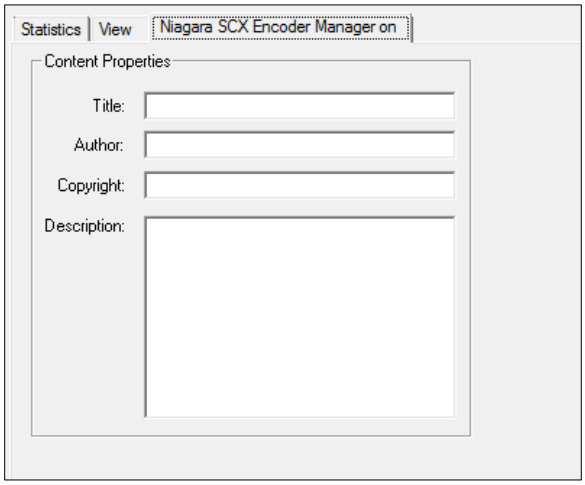
The View tab has the following controls.

| | |
|---|---|
| **Start Preview** | Click **Start Preview** to initiate the view following a buffer delay. |
| **Stop Preview** | Click **Stop Preview** to stop displaying the video immediately.<br>*Note: Playback stops automatically when you select another encoder.* |
| **URL Information** | Displays the URL information. |
| **Copy Lan URL** | Click this button to copy the LAN URL. |
| **Copy Internet URL** | Click this button to copy the Internet URL. |
| **Launch URL** | Click this button to launch the Windows Media Player to view the stream. |

# Niagara SCX Encoder Manager

Use the Niagara SCX Encoder Manager on tab (Figure 34) to enter information about the video content. If you choose to enter any information in the fields provided, you must do so before you start the encoder.

**Figure 34. Niagara SCX Encoder Manager on tab**




| | |
|---|---|
| **Title** | Enter the title of the video. |
| **Author** | Enter the author of the video. |
| **Copyright** | Enter the copyright information. |
| **Description** | Enter the description of the video. |

# DRM for Windows Media

You can protect your content using Digital Rights Management (DRM) technology. Niagara SCX allows you to encrypt your content with DRM technology while you encode. You can apply DRM while encoding to a file and when broadcasting a stream. Users must obtain a license to play the content. This license contains the key to unlock the content and the rights that govern its use.

*Note: A third-party license provider issues licenses. Therefore, you must set up an account with a third-party license provider to protect your content.*

## Enabling DRM function

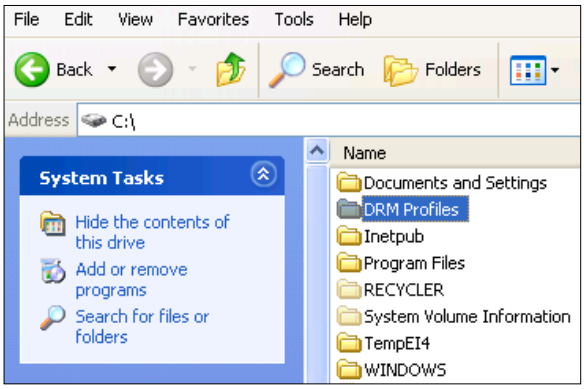
Niagara SCX automatically detects any available DRM profiles imported on the encoding system. If you have no DRM profiles installed, the system disables the DRM functions in Niagara SCX.

**To enable DRM function in Niagara SCX**:

1. Set up an account and create a DRM profile with a third-party license provider.
   - Use the Windows Media Encoder application included with the Niagara streaming systems or available as a free download from Microsoft (http://www.microsoft.com) to import the DRM profile.
   - Restart the encoding system where you installed Niagara SCX allowing the software to auto-detect and enable its DRM functions.
2. Import a DRM profile.
   - Set up an account with a licensed provider and create a DRM profile if you do not already have one.
   - Use Windows Media Encoder to import the profile on the encoding system once you create the DRM profile.

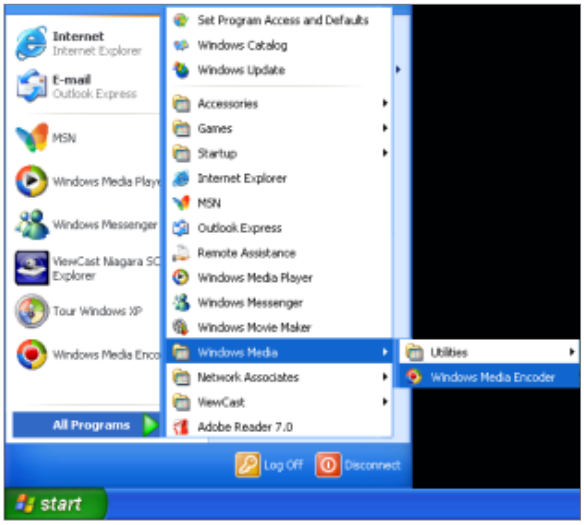
3. Copy the DRM profiles to a protected location (Figure 35) on the encoding system to ensure nothing accidentally removes or erases them.

**Figure 35. DRM Profiles Location**



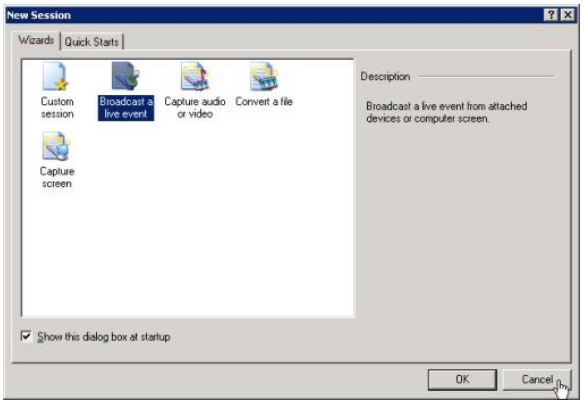

4. Start the Windows Media Encoder application (Figure 36) on the encoder system.

**Figure 36. Encoder Start Up**



5. Click **Cancel** when the **New Session Wizard** (Figure 37) displays.

**Figure 37. New Session**

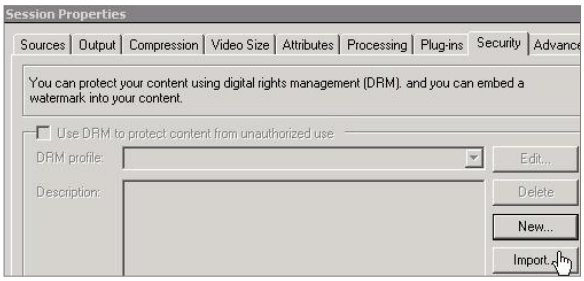



6. Click **Properties** under the top menu bar.

**Figure 38. Properties option**

7. Click the **Security** tab (Figure 39).

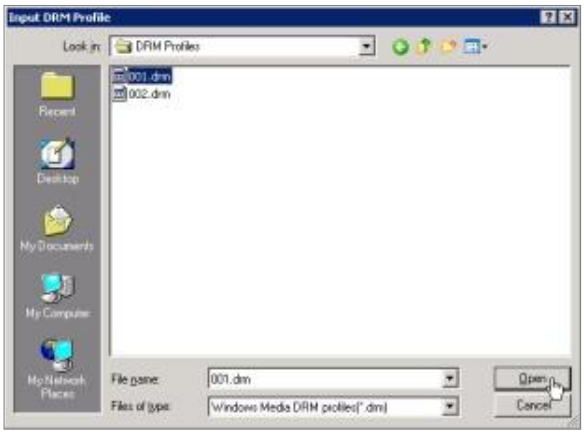
**Figure 39. Security tab**




8. Click **Import** and browse to the location of the DRM profiles on the system's hard drive.

9. Click the DRM profile (Figure 40) you wish to import and click the **Open** option.

**Figure 40. Input DRM Profile**




10. Repeat this process for each DRM profile you wish to import.
11. Exit from the Windows Media Encoder application when you finish.
12. Click **No** if the system asks if you want to save your encoding session.
13. Restart the system.

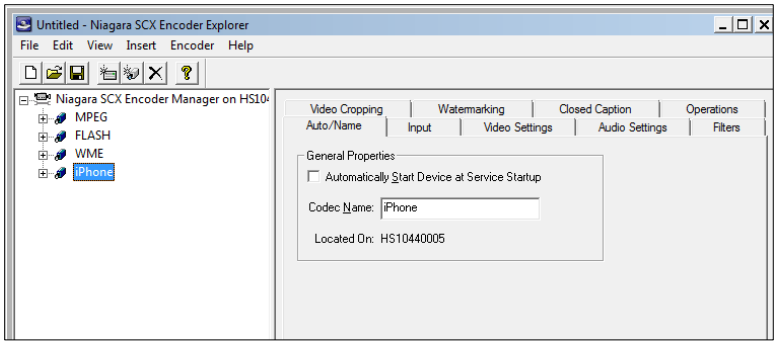
# Adaptive Streaming Options and Settings

The adaptive and dynamic capabilities of Niagara SCX will markedly improve the live streaming delivery experience for both broadcasters and Apple® iPhone® mobile digital device users. By eliminating the need for an external segmenter, encoding workflows are simplified and overall system costs reduced.

*Note: You must first set up adaptive streaming through the web interface on your Niagara system.*

## Auto/Name tab

**Figure 41. Auto/Name tab**



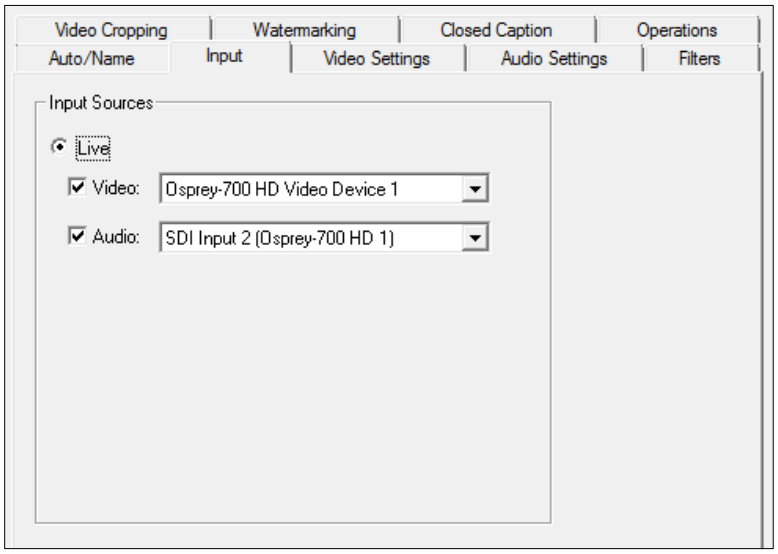

The Auto/Name tab has the following controls.

| | |
|---|---|
| **Automatically Start Device at Service Startup** | Enable this field to start the encoder when the Niagara SCX service starts. |
| **Codec Name** | Enter the name of the encoder. |
| **Located On** | Indicates the name of the machine where the encoder resides. |

# Input tab

Use the Input tab (Figure 42) to set the input sources to use for Live or File conversion/File Transcode.

**Figure 42. Input tab**




**To set the input source:**

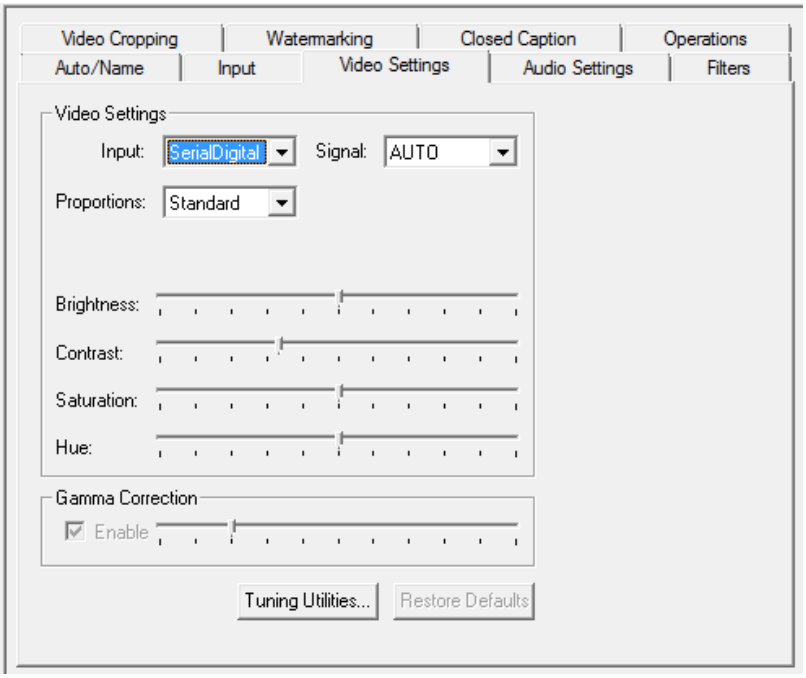
1. Click **Live**.
2. Click the video capture device from the drop-down list in the **Video** field.

   *Note: The system lists all known video and audio devices in drop-down boxes.*
3. Click the audio device from the drop-down list in the **Audio** field for live encoding.

# Video Settings tab

Use the Video Settings tab (Figure 43) to control the capture properties for the selected video device.

**Figure 43. Video Settings tab**



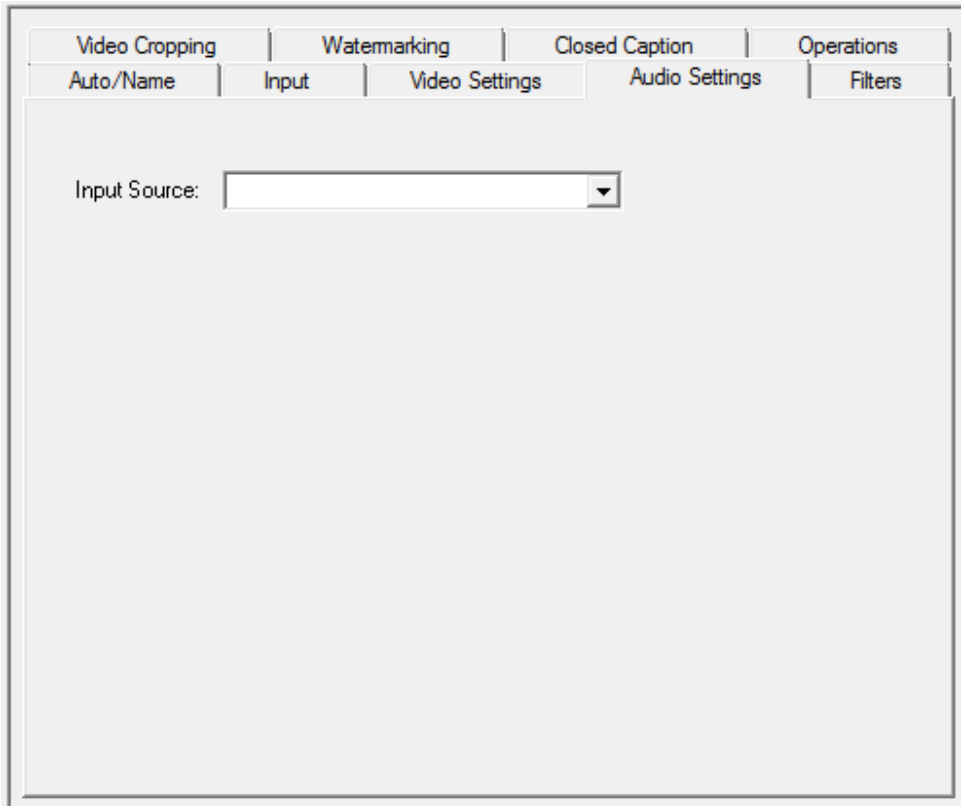

The Video Settings tab has the following controls.

| | |
|---|---|
| **Input** | Select the input connectors available for capture device from the drop-down list. |
| **Signal** | Select the video standards the capture device supports from the drop-down list. |
| **Proportions** | Select the capture properties from the drop-down list. |
| **Brightness**<br>**Contrast**<br>**Saturation**<br>**Hue** | Drag the sliders to adjust the capture properties individually. These capture properties remain available regardless of whether the encoder starts or remains idle.<br>*Note: When making adjustments, verify adjustments apply to chosen input. Otherwise, your adjustments apply to all the input sources listed.* |
| **Gamma Correction** | Adjust the gamma of the incoming video. See *Gamma Correction* for more information. |
| **Tuning Utilities** | Click **Tuning Utilities** to access tuning utilities for a selected card. Refer to *Tuning Utilities* for additional diagnostics information. |
| **Restore Defaults** | Click **Restore Defaults** to restore the system to the factory defaults. |

# Audio Settings tab

You no longer use the Audio Settings tab (Figure 44) to set the input source. Use the web interface for your Niagara system to set the input source for the selected audio devices.

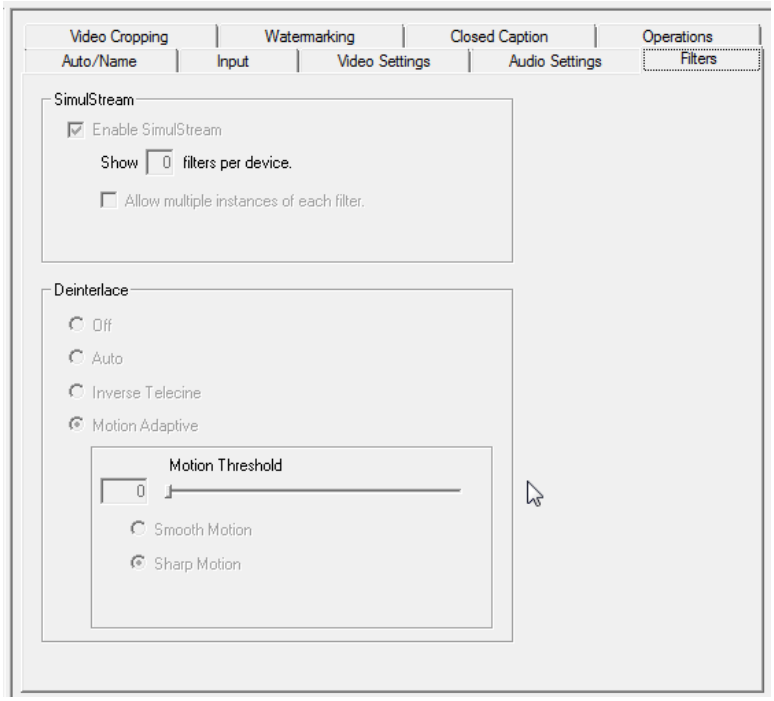
**Figure 44. Audio Settings tab**



# Filters tab

Use the Filters tab (Figure 45) to enable SimulStream and deinterlacing. This tab is optional. See *Niagara SCX and SimulStream* for information on how to set up a SimulStream session and filters. Also, see *Deinterlace* for information on telecine, inverse telecine, and motion adaptive.

**Figure 45. Filters tab**




The Filters tab has the following controls.

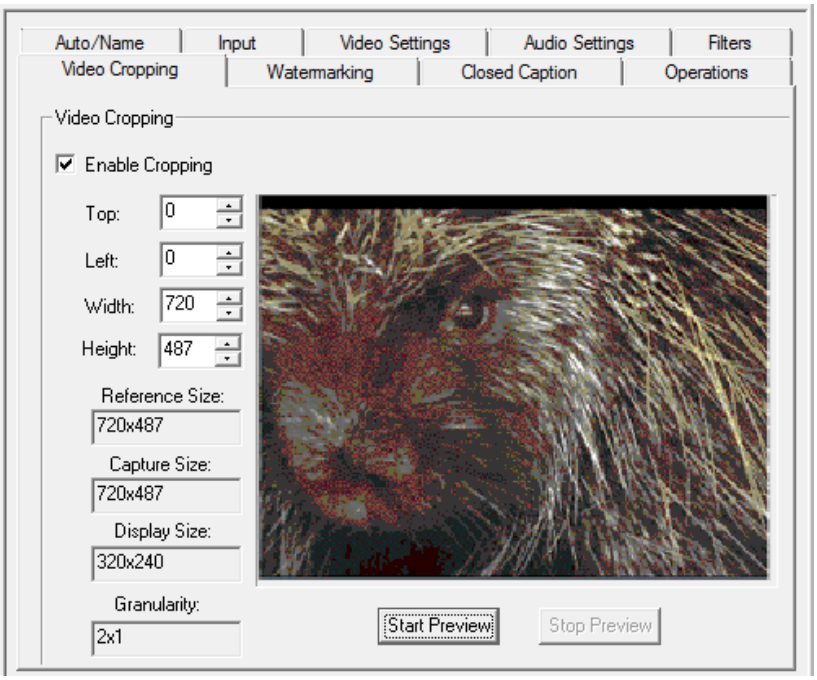
| | |
|---|---|
| **Enable SimulStream** | Select SimulStream. |
| **Show X filters per device** | Specify how many filters you plan to expose. |
| **Allow multiple instances of each filter** | Select this field to allow multiple video capture streams. |
| **Off** | Perform no deinterlacing of any kind. |
| **Auto** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Apply motion adaptive deinterlacing to video that is not telecine.<br>• Switch dynamically between the two modes as the content changes.<br>*Note: Available for NTSC video only.* |

| | |
|---|---|
| **Inverse Telecine** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Perform no deinterlacing of video that is not telecine.<br>*Note: Available for NTSC video only*. |
| **Motion Adaptive** | Apply motion adaptive deinterlacing to all video. |
| **Motion Threshold** | The Motion Threshold slider and edit box adjust the threshold of difference from spatially and temporally related pixels that is in motion. As you move the slider to the left, the number of motion pixels greatly increases until nearly the entire screen is in motion. The recommended default is 16. |
| **Smooth Motion** | The Smooth Motion option results in more loss of detail in motion areas, but edges are smoother. This algorithm uses a bit more CPU. |
| **Sharp Motion** | The Sharp Motion option makes detail in motion areas sharper, but at the expense of somewhat jagged diagonal edges. |

# Video Cropping tab

Use the Video Cropping tab (Figure 46) to set the size an aspect ratio of chosen video output.

**Figure 46. Video Cropping tab**



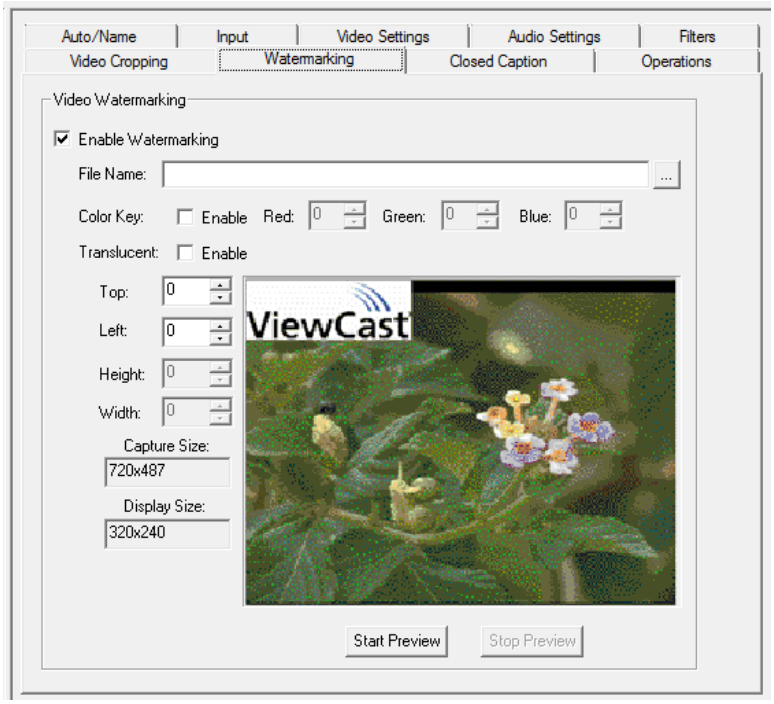

The Video Cropping tab has the following controls.

| | |
|---|---|
| **Enable Cropping** | When you select cropping, the system automatically switches the video size to FULL and the cropping measurements default to the FULL size.<br>From the **Top**, **Left**, **Width**, and **Height** settings, you can set a custom cropping size. |
| **Reference Size**<br>**Capture Size**<br>**Display Size**<br>**Granularity** | These fields refer to the size of the video. |
| **Start Preview** | Click this button to preview the video with your crop settings. |
| **Stop Preview** | Click this button to stop the preview. |

# Watermarking tab

Use the Watermarking tab (Figure 47) to place a watermarked graphic over your video output.

**Figure 47. Watermarking tab**



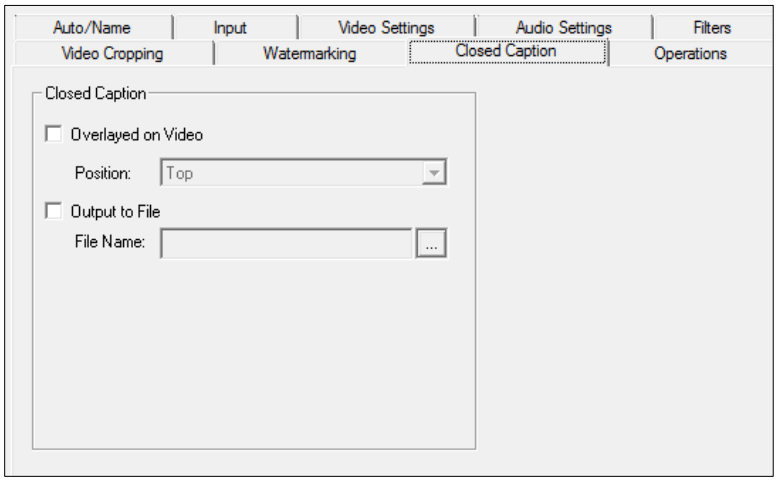

The Watermark tab has the following controls.

| | |
|---|---|
| **Enable Watermarking** | Select this field to place a watermarked graphic over your video output.<br>*Note: You can only watermark a 24-bit bmp. The system does not accept any other image formats.* |
| **File Name** | Click on the browse button at the end of the field to search for a file name of the graphic you want to use. |
| **Color Key** | Select this field to adjust the color balance, size, and opacity of the graphic. |
| **Translucent** | Select this field to render the graphic translucent. |
| **Top**<br>**Left**<br>**Height**<br>**Width** | Use these controls to adjust the location of the graphic. |
| **Capture Size** | Indicates the size of the capture. |
| **Display Size** | Indicates the size of the display. |
| **Start Preview** | Click this button to preview the watermark on the video. |
| **Stop Preview** | Click this button stop the preview. |

# Closed Caption tab

Use the Closed Caption tab (Figure 48) to adjust the positioning of closed caption text if applicable, on your video feed.

**Figure 48. Closed Caption tab**

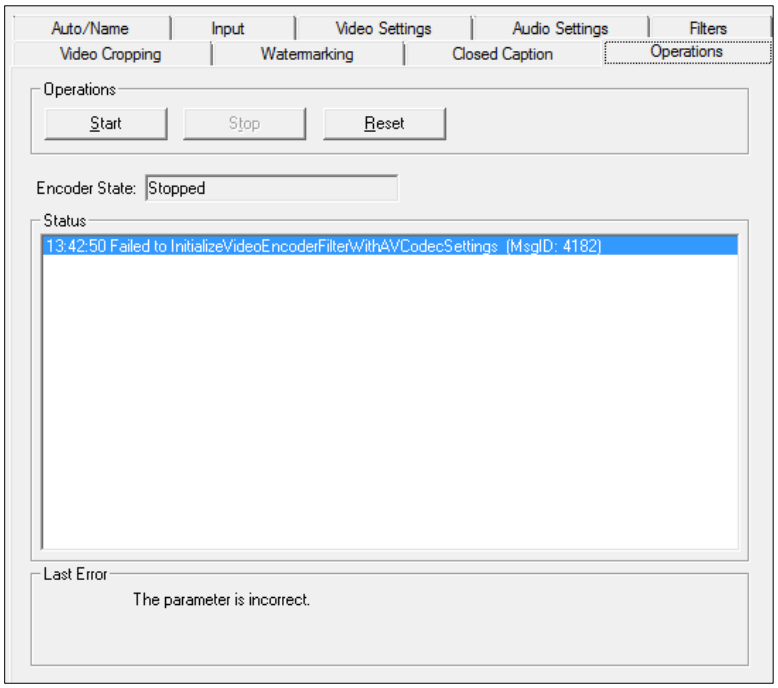



The Closed Caption tab has the following controls.

| | |
|---|---|
| **Overlayed on Video** | Select this field to overlay the closed caption text on the video stream. |
| **Position** | Select the position of the closed caption text from the drop-down list. |
| **Output to File** | Select this field to capture the closed caption text into a SAMI file. |
| **File Name** | Click the browse button at the end of the field to search for a file name.<br>*Note: The SAMI field path you enter must include a shared directory, partition, or drive.* |

# Operations tab

**Figure 49. Operations tab**




The Operations tab has the following controls.

| | |
|---|---|
| **Start** | Click this button to begin encoding. |
| **Stop** | Click this button to end the session. |
| **Reset** | Click this button to stop the restart an encoding session. |
| **Encoder State** | Indicates the status of the encoder (started, stopped). |
| **Status** | Progress report and error messages appear in the Status section of this window. |
| **Last Error** | The last error displays in this window. |

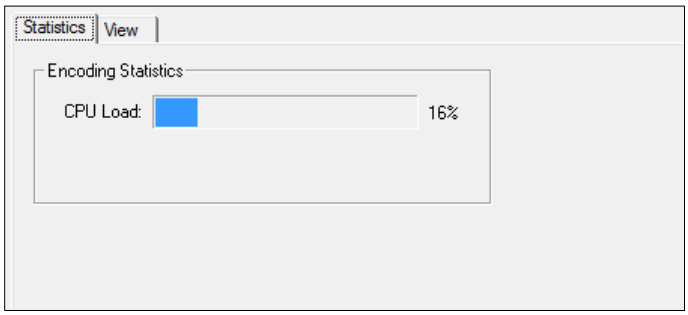
# Adaptive Streaming Options

The Adaptive streaming options tabs include Statistics and View.

## Statistics tab

Use the Statistics tab (Figure 50) to view the current CPU usage.

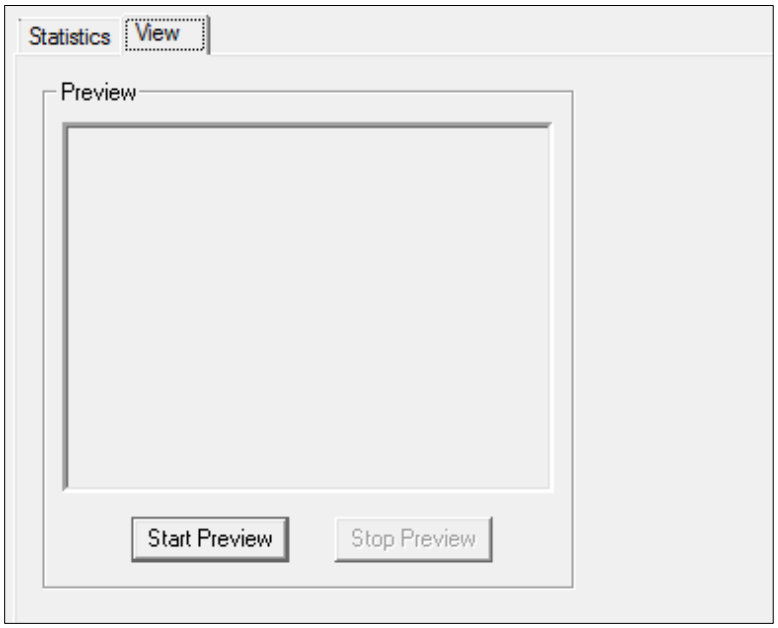
**Figure 50. Statistics tab**



# View tab

Use the View tab (Figure 51) to monitor the output of the encoder. To watch the incoming video or see the output video standards, you must have installed Osprey SimulStream for the capture. Osprey SimulStream lets a single card produce multiple outputs. For more information or to purchase SimulStream for your Osprey capture card, visit http://viewcast.com/products/software/simulstream.

**Figure 51. View tab**




| | |
|---|---|
| **Start Preview** | Click this button to preview the video. |
| **Stop Preview** | Click this button to end the preview. |

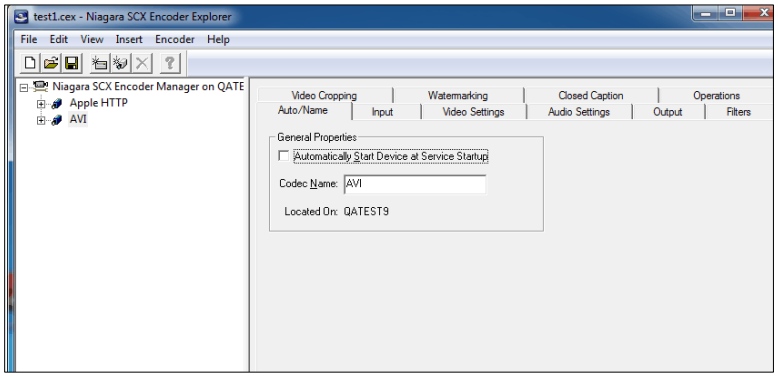
# AVI Capture Options and Settings

When capturing uncompressed AVI files, ensure your system's hard drive speed can keep up with the data you capture. If not, the capture file drops frames and loses quality. ViewCast recommends you perform video captures to a high speed external or network drive.

*Note: Due to file size, high-definition streaming media appliances cannot capture AVI files.*

## Auto/Name tab

**Figure 52. Auto/Name tab**



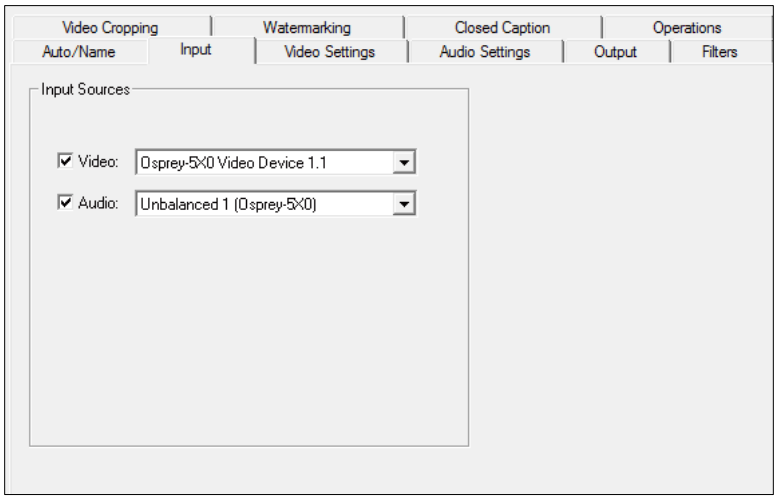

The Auto/Name tab has the following controls.

| | |
|---|---|
| **Automatically Start Device at Service Startup** | Select this field to start the encoder when the Niagara SCX service starts. |
| **Codec Name** | Enter the name of the encoder. |
| **Located On** | Displays the name of the machine where the encoder resides. |

# Input tab

Use on the Input tab (Figure 53) to set the input source.

**Figure 53. Input tab**



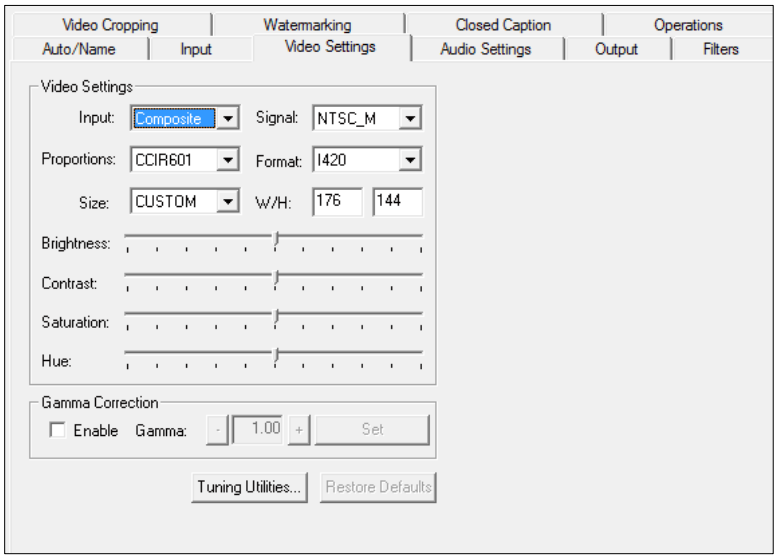

**To set the input source:**

1. Click **Live**.
2. Click the video capture device from the drop-down list in the **Video** field.
   *Note: The system lists all known video and audio devices in drop-down menus.*
3. Click the audio device from the drop-down list in the **Audio** field for live encoding.

# Video Settings tab

You can control the capture properties for the selected video device on the Video Settings tab (Figure 54):

**Figure 54. Video Settings tab**



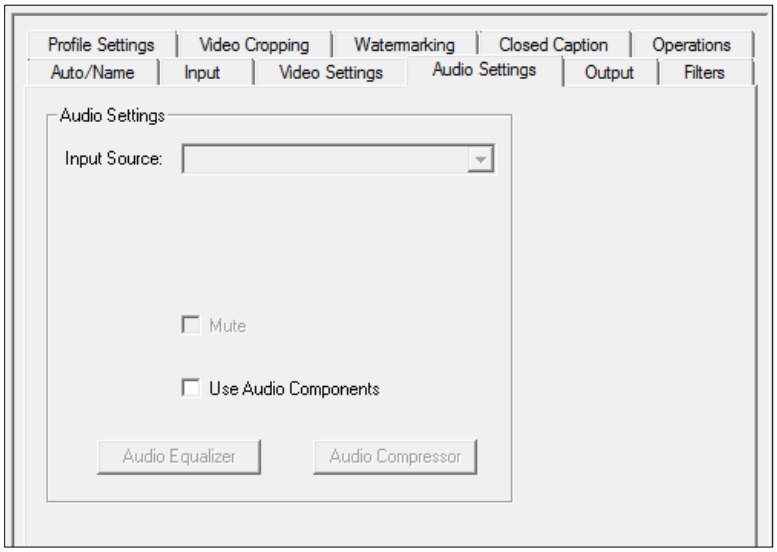

The Video Settings tab has the following controls.

| | |
|---|---|
| **Input** | Select the input connectors for the capture device from the drop-down list. |
| **Signal** | Select the video standard the capture device supports from the drop-down list. |
| **Proportions**<br>**Format**<br>**Size**<br>**W/H** | Select the video properties from the drop-down list. |
| **Brightness**<br>**Contrast**<br>**Saturation**<br>**Hue** | Drag the slider to adjust the capture properties. When making adjustments, verify adjustments apply to chosen input. Otherwise, your adjustments apply to all the input sources listed.<br>*Note: These capture properties remain available regardless of whether the encoder starts or remains idle.* |
| **Gamma Correction** | Adjust the gamma of the incoming video. (See *Gamma Correction* for more information.) |
| **Tuning Utilities** | Click **Tuning Utilities** to access tuning utilities for a selected card. Refer to *Tuning Utilities* for additional diagnostics information. |
| **Restore Defaults** | Click **Restore Defaults** to restore the system to the factory defaults |

# Audio Settings tab

You no longer use the Audio Settings tab (Figure 55) to set the input source. Use the web interface for your Niagara system to set the input source for the selected audio devices. You can mute the audio and use the audio components on the Audio Settings tab.

**Figure 55. Audio Settings tab**

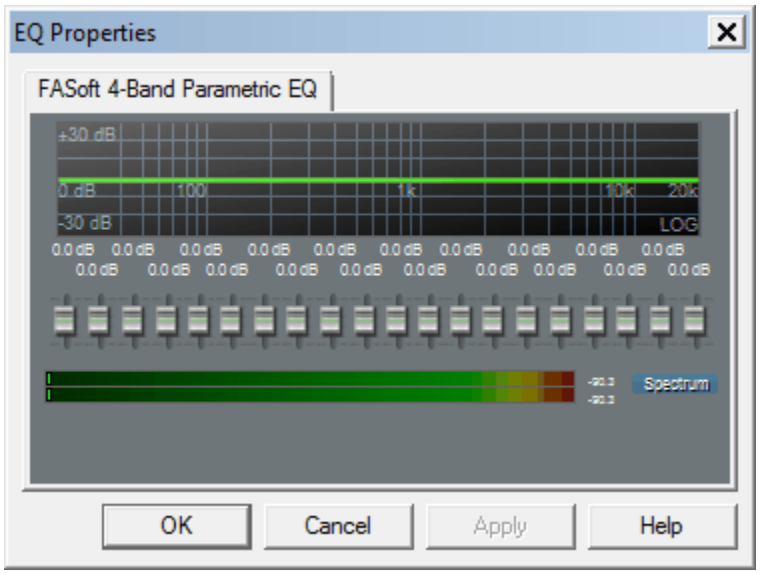



The Audio Settings tab has the following controls.

| | |
|---|---|
| **Input Source** | This field is not functional. |
| **Mute** | Select this field to mute the audio. |
| **Use Audio Components** | Select this field to enable the Audio Equalizer and Audio Compressor buttons. |
| **Audio Equalizer** | Click this button to display the EQ Properties window (see EQ Properties window). |
| **Audio Compressor** | Click on this button to display the Compressor Properties window (see *Compressor Properties window*). |

# EQ Properties window

**Figure 56. EQ Properties window**



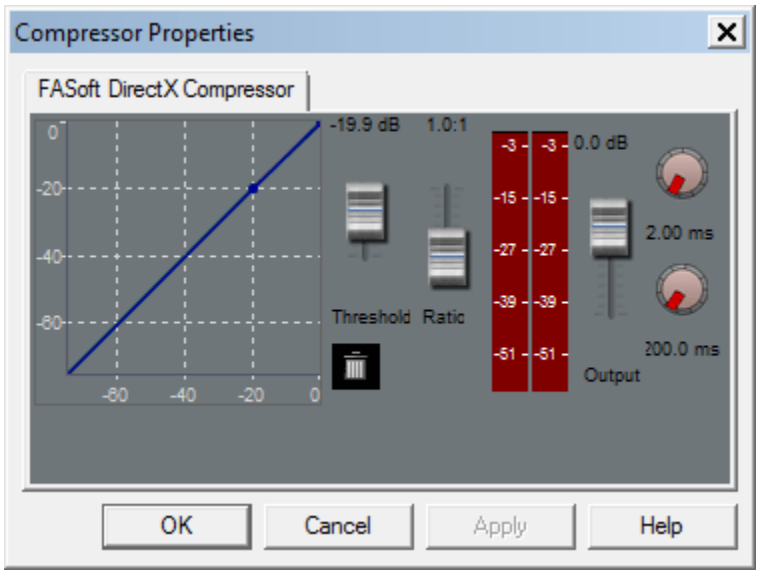

**To adjust the audio equalizer:**

1. Click on a band and slide it up or down to adjust the boost/cut at the specific frequency.
2. Click **OK** or **Apply** to set your changes.

   *Note: Click **Cancel** to cancel your changes and close the window.*
   *Click **Help** to access the user guide.*
3. Right click on the graph to change the equalizer graph properties.

# Compressor Properties window

**Figure 57. Compressor Properties window**



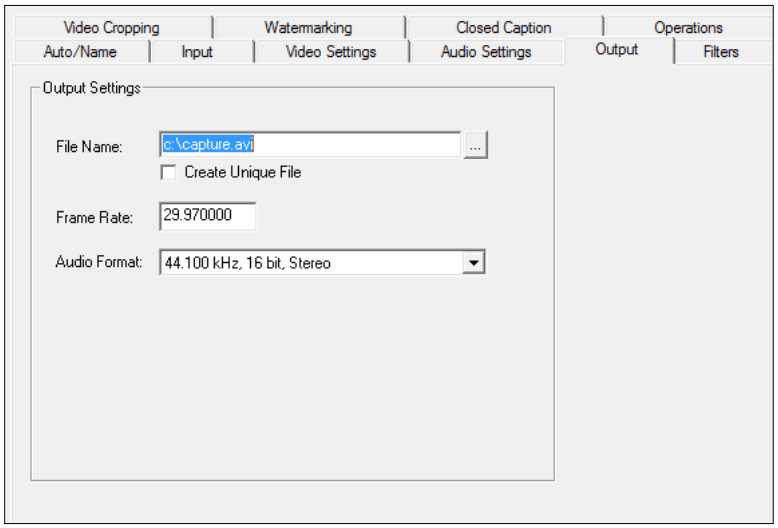

The Compressor Properties window has the following controls.

| | |
|---|---|
| **Dynamics graph plot** | Displays the settings as you adjust them. |
| **Threshold slider** | Click on the button and push up or down to adjust the threshold. |
| **Reset icon** | Click this icon to reset the dynamics graph plot |
| **Compression Ratio slider** | Click on this button and push up or down to adjust the compression. |
| **Output gain** | Click this button and push up or down to adjust the output. |
| **Attack time** | This clock indicates the attack time in milliseconds for the time it takes for the gain to increase by the output gain amount. |
| **Release time** | This clock indicates the release time in milliseconds for the time it takes for the gain to decrease by the output gain amount. |

# Output tab

Use the Output tab (Figure 58) to set the output frame rate, format, and destination. The Niagara SCX and SCX Explorer reside on different computers.

**Figure 58. Output tab**



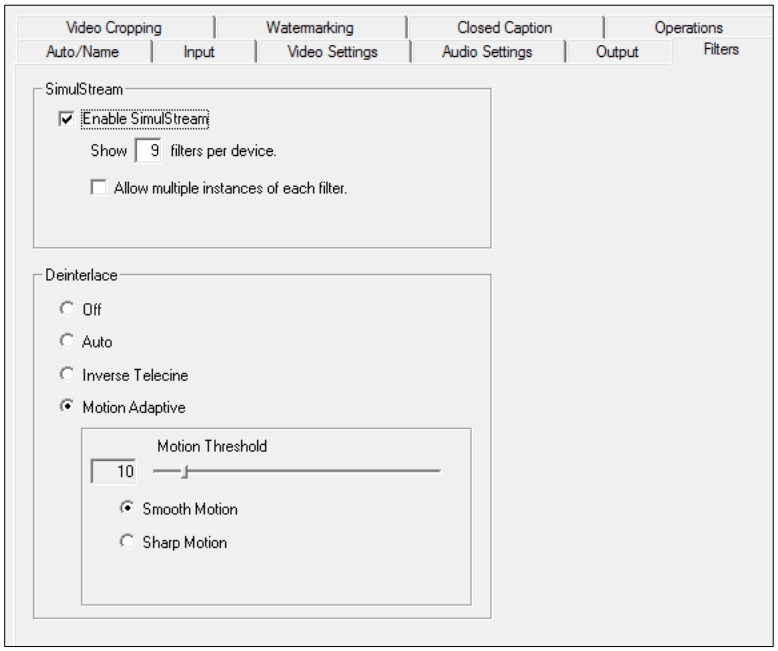

The Output tab has the following controls.

| | |
|---|---|
| **File Name** | Click on the browse button at the end of the field to search for a file name.<br>*IMPORTANT! When Niagara SCX and SCX Explorer reside on different computers, always start your browse for files by clicking Network. Then work down or enter the entire file pathname beginning with the system name (such as \\fileserver\c\videos).*<br>*If you simply enter a file name, you may inadvertently browse your local computer when the media file resides on the remote computer.*<br>*Note: Remember the file name applies to the encoder and not the system currently running SCX Explorer.* |
| **Create Unique File** | Select this field to create a file that the system does not overwrite. |
| **Frame Rate** | Enter the frame rate. |
| **Audio Format** | Select the audio format from the drop-down list. |

# Filters tab

Use the Filters tab (Figure 59) to enable SimulStream and deinterlacing. This tab is optional. See *Niagara SCX and SimulStream* for information on how to set up a SimulStream session and filters. Also, see *Deinterlace* for information on telecine, inverse telecine, and motion adaptive.

**Figure 59. Filters tab**




The Filters tab has the following controls.

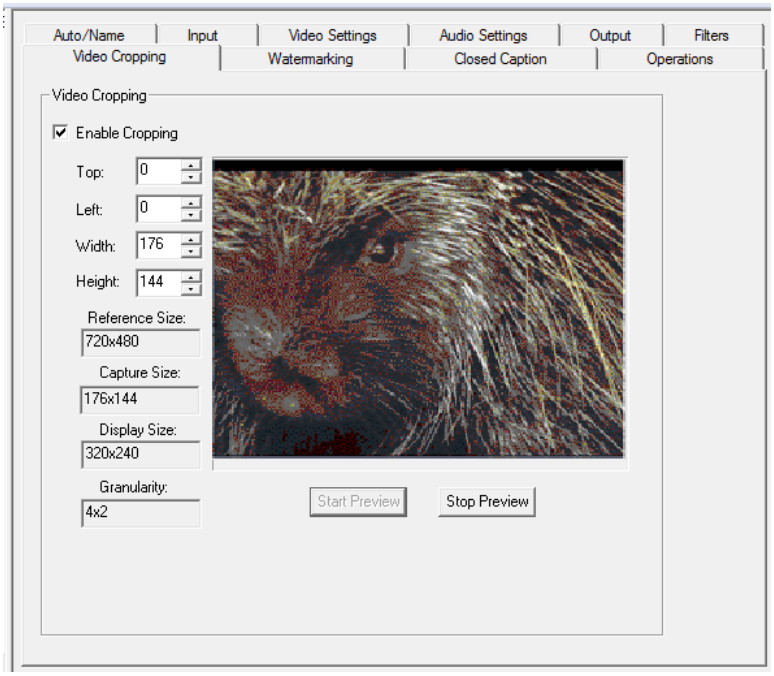
| | |
|---|---|
| **Enable SimulStream** | Select SimulStream. |
| **Show X filters per device** | Specify how many filters you plan to expose. |
| **Allow multiple instances of each filter** | Select this field to allow multiple video capture streams. |
| **Off** | Perform no deinterlacing of any kind. |
| **Auto** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Apply motion adaptive deinterlacing to video that is not telecine.<br>• Switch dynamically between the two modes as the content changes.<br>*Note: Available for NTSC video only.* |
| **Inverse Telecine** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Perform no deinterlacing of video that is not telecine.<br>*Note: Available for NTSC video only.* |

| | |
|---|---|
| **Motion Adaptive** | Apply motion adaptive deinterlacing to all video. |
| **Motion Threshold** | The Motion Threshold slider and edit box adjust the threshold of difference from spatially and temporally related pixels that are in motion. As you move the slider to the left, the number of motion pixels greatly increases until nearly the entire screen is in motion. The recommended default is 16. |
| **Smooth Motion** | The Smooth Motion option results in more loss of detail in motion areas, but edges are smoother. This algorithm uses a bit more CPU. |
| **Sharp Motion** | The Sharp Motion option makes detail in motion areas sharper, but at the expense of somewhat jagged diagonal edges. |

# Video Cropping tab

Use the Video Cropping tab (Figure 60) for options for setting the size and aspect ratio of your chosen video output.

**Figure 60. Video Cropping tab**




The Video Cropping tab has the following controls.

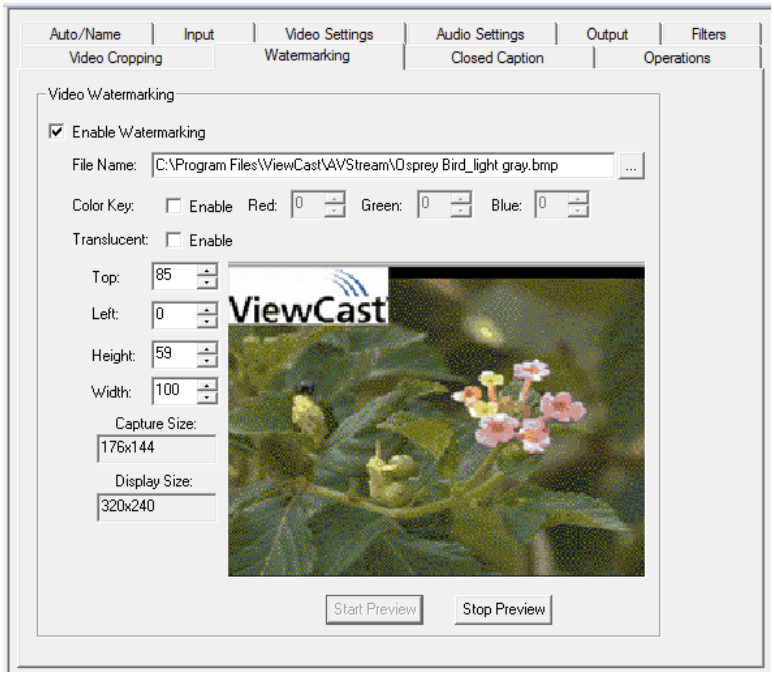
| | |
|---|---|
| **Enable Cropping** | When you select cropping, the system automatically switches the video size to FULL and the cropping measurements default to the FULL size.<br>From the **Top**, **Left**, **Width**, and **Height** settings, you can set a custom cropping size. |
| **Reference Size**<br>**Capture Size**<br>**Display Size**<br>**Granularity** | These fields refer to the size of the video. |
| **Start Preview** | Click this button to preview the video with your crop settings. |
| **Stop Preview** | Click this button to stop the preview. |

# Watermarking tab

Use the Watermarking tab (Figure 61) to place a watermarked graphic over your video output.

*Note: You can only watermark a 24-bit bmp. The system does not accept any other image formats.*

**Figure 61. Watermarking tab**



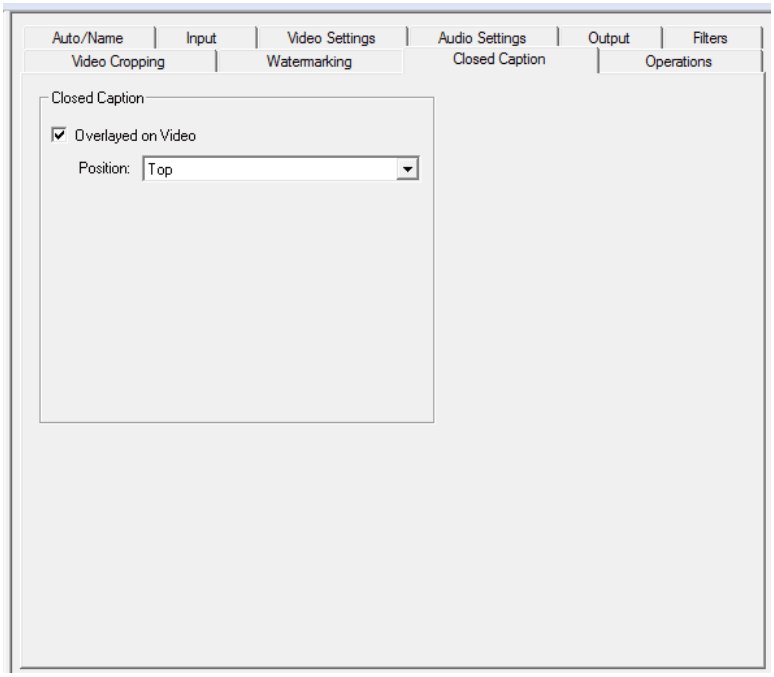

The Watermark tab has the following controls.

| | |
|---|---|
| **Enable Watermarking** | Select this field to place a watermarked graphic over your video output.<br>*Note: You can only watermark a 24-bit bmp. The system does not accept any other image formats.* |
| **File Name** | Click on the browse button at the end of the field to search for a file name of the graphic you want to use. |
| **Color Key** | Select this field to adjust the color balance, size, and opacity of the graphic. |
| **Translucent** | Select this field to render the graphic translucent. |
| **Top**<br>**Left**<br>**Height**<br>**Width** | Use these controls to adjust the location of the graphic. |
| **Capture Size** | Indicates the size of the capture. |
| **Display Size** | Indicates the size of the display. |
| **Start Preview** | Click this button to preview the watermark on the video. |
| **Stop Preview** | Click this button to stop the preview. |

# Closed Caption tab

Use the Closed Caption tab (Figure 62) to adjust the position of any closed-captioned text you want to add if you use the Osprey 3.X or a later version of the driver for video capturing.

**Figure 62. Closed Caption tab**

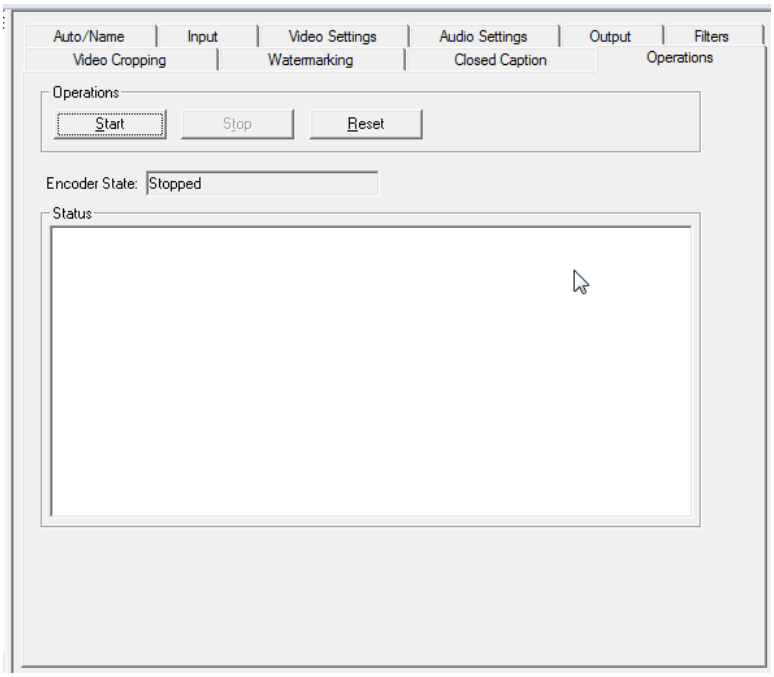



The Closed Caption tab has the following controls.

| | |
|---|---|
| **Overlayed on Video** | Select this field to overlay the closed caption text on the video stream. |
| **Position** | Select the position of the closed caption text from the drop-down list. |

# Operations tab

**Figure 63. Operations tab**




The Operations tab has the following controls.

| | |
|---|---|
| **Start** | Click this button to begin encoding. |
| **Stop** | Click this button to end the session. |
| **Reset** | Click this button to stop the restart an encoding session. |
| **Encoder State** | Indicates the status of the encoder (started, stopped). |
| **Status** | A progress report and error messages appear in the Status section of this window. |

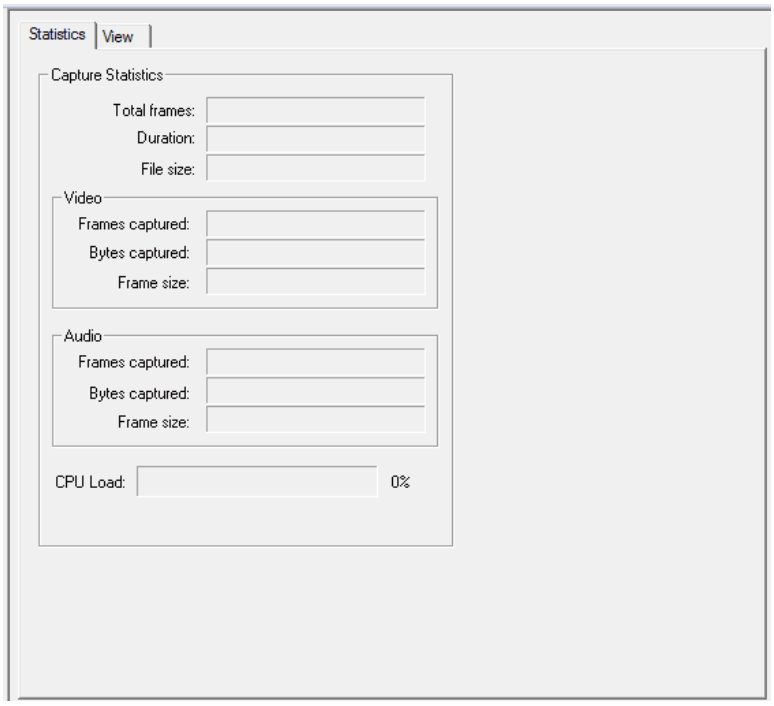
# AVI Capture streaming options tabs

The AVI streaming options tabs include Statistics and View.

## Statistics tab

Use the Statistics tab (Figure 64) to view the status of the encoder.

**Figure 64. Statistics tab**



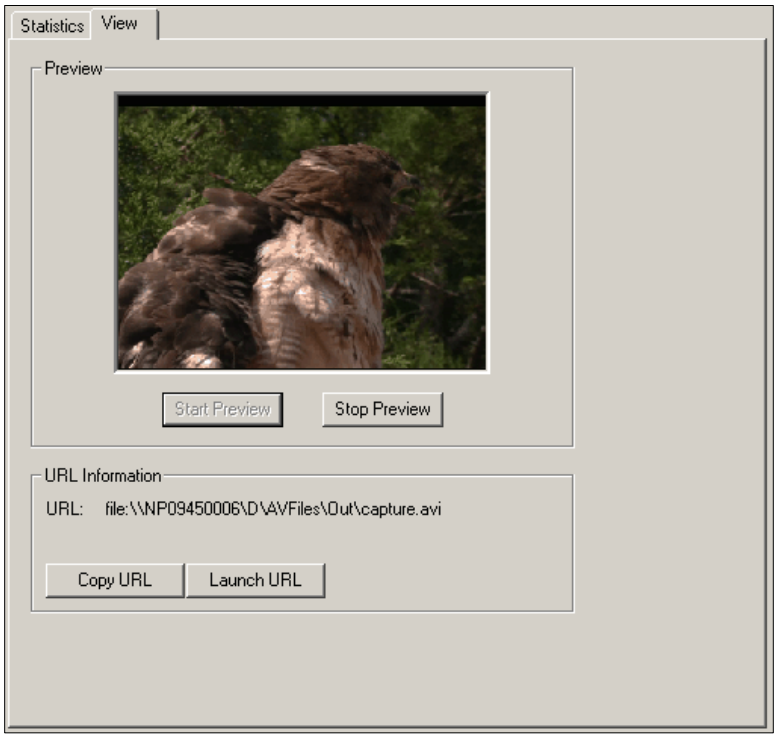
The Statistics tab has the following controls.

| | |
|---|---|
| **Total frames** | The total number of frames in the capture. |
| **Duration** | The duration of the capture. |
| **File Size** | The size of the file. |
| **Frames captured** | The number of video frames captured. |
| **Bytes captured** | The number of video bytes captured. |
| **Frame size** | The size of the video frames. |
| **Frames captured** | The number of audio frames captured. |
| **Bytes captured** | The number of audio bytes captured. |
| **Frame size** | The size of the audio frame. |
| **CPU Load** | The current system CPU load and audio level. |

# View tab

To preview the video while encoding or to see the output video, you must have enabled Osprey SimulStream for the capture card. Osprey SimulStream enables a single card to produce multiple outputs. For more information or to purchase SimulStream for your Osprey capture card, visit http://viewcast.com/products/software/simulstream. Monitor the encoder output on the View tab (Figure 65).

**Figure 65. View tab**




The View tab has the following controls.

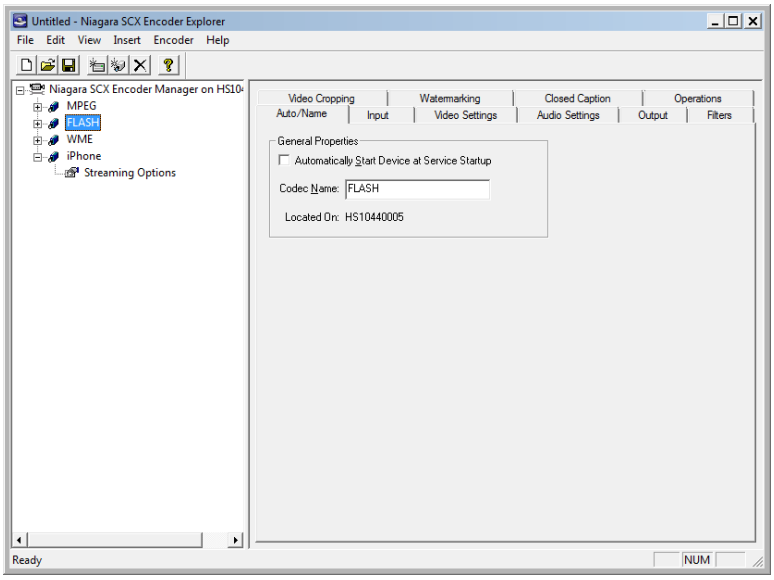
| | |
|---|---|
| **Start Preview** | Click **Start Preview** to initiate the view following a buffer delay. |
| **Stop Preview** | Click **Stop Preview** to stop displaying the video immediately.<br>*Note: Playback stops automatically when you select another encoder.* |
| **URL Information** | Displays the URL information. |
| **Copy URL** | Click this button to copy the URL. |
| **Launch URL** | Click this button to launch the Windows Media Player to view the stream. |

# *Flash Options and Settings*

Flash format is only available on select encoding appliances.

## Auto/Name tab

**Figure 66. Auto/Name tab**



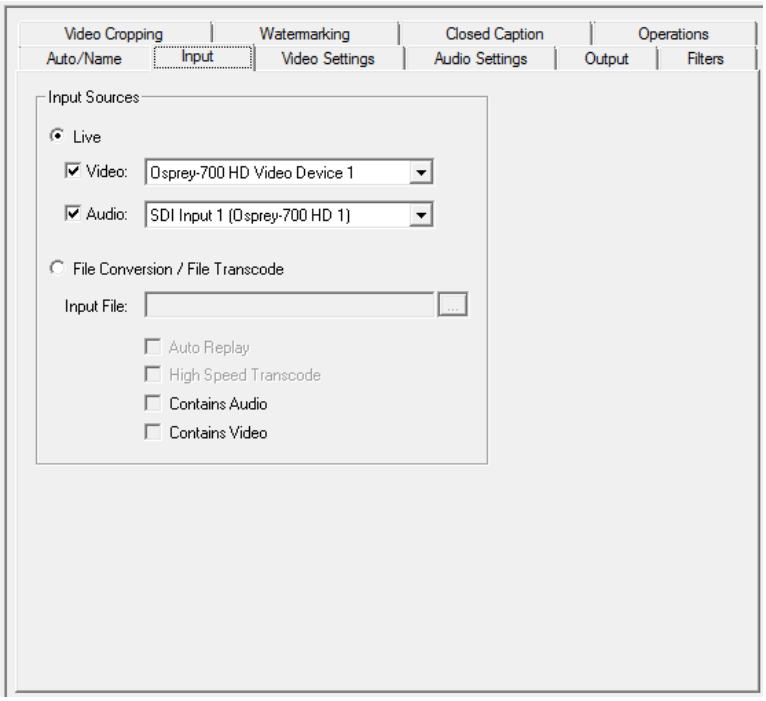

The Auto/Name tab has the following controls.

| | |
|---|---|
| **Automatically Start Device at Service Startup** | Select this field to start the encoder when the Niagara SCX service starts. |
| **Codec Name** | Enter the name of the encoder. |
| **Located On** | Indicates the name of the machine where the encoder resides. |

# Input tab

Use the Input tab (Figure 67) to set the input sources to use for Live or File Conversion/ File Transcode encoding.

**Figure 67. Input tab**




**To set a live input source:**

1. Click **Live**.
2. Click the video capture device from the drop-down list in the **Video** field.
3. Click the audio device from the drop-down list in the **Audio** field for live encoding.
   *Note: The system lists all known video and audio devices in the drop-down menus.*

**To set file conversion:**

1. Click **File Conversion/File Transcode** to encode a previously recorded file (such as .avi or .wav files) into streaming format.
2. Click on the browse button at the end of **Input File** to browse for a file name to insert. The Open window displays.

   *IMPORTANT! When Niagara SCX and SCX Explorer reside on different computers, always start your browse for files by clicking Network. Then work down or enter the entire file pathname beginning with the system name (such as \\fileserver\c\videos).*

   *If you simply enter a file name, you may inadvertently browse your local computer when the media file resides on the remote computer.*

   *Note: Remember the file name applies to the encoder and not the system currently*

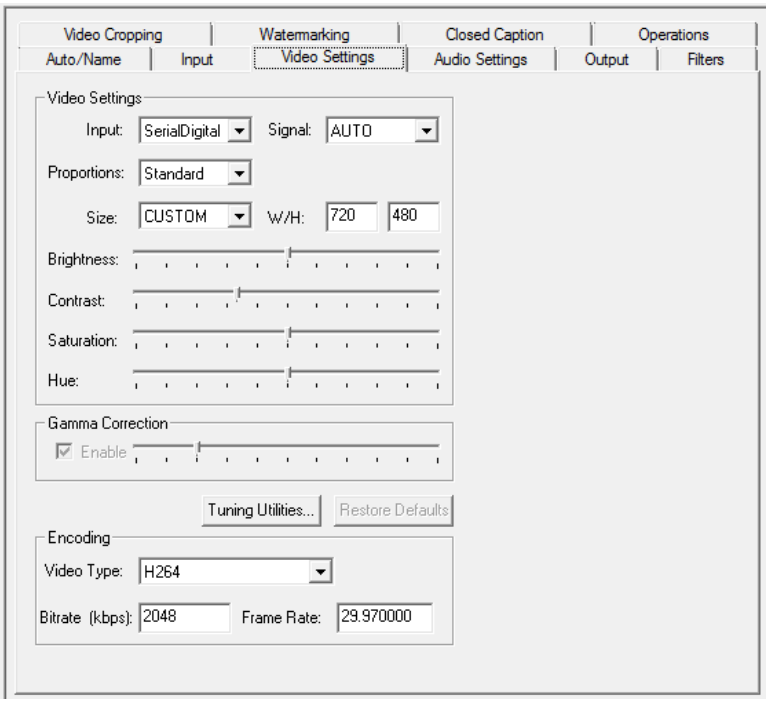
*running SCX Explorer*.

3. Enable **Auto Replay** to replay the file automatically.
4. Enable **High Speed Transcode** to transcode the file at high speed.
5. Enable **Contains Audio** to indicate if the input file contains audio.
6. Enable **Contains Video** to indicate if the input file contains video.

# Video Settings tab

Use the Video Settings tab (Figure 68) to control the capture properties for the selected video device.

**Figure 68. Video Settings tab**




The Video Settings tab has the following controls.

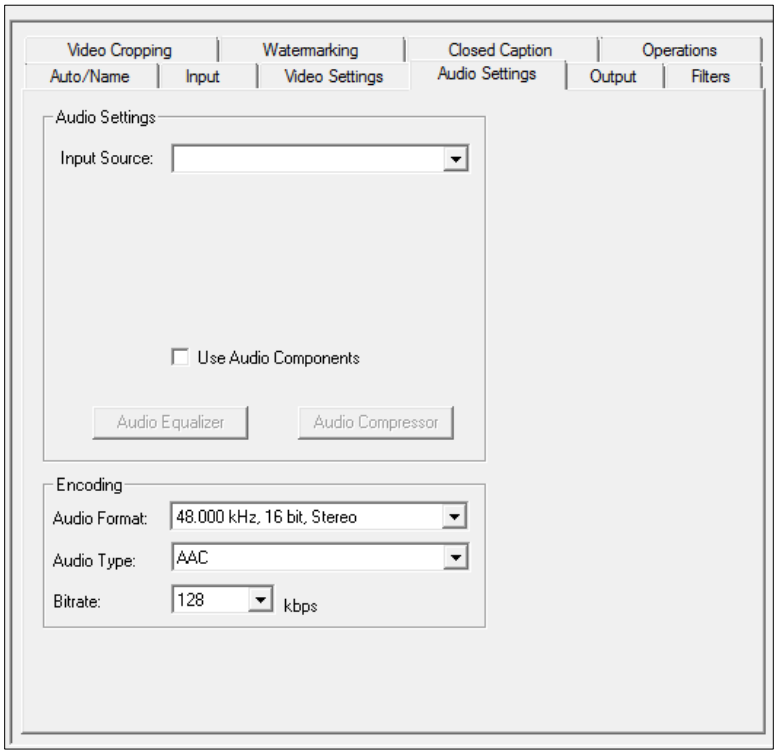
| | |
|---|---|
| **Input** | Select the input connectors available for the capture device from the drop-down list. |
| **Signal** | Select the video standards the capture device supports from the drop-down list. |
| **Proportions, Size, W/H** | Use these fields to adjust capture properties such as proportion, video size, and width/height. |
| **Brightness, Contrast, Saturation, Hue** | Drag the slider to adjust additional capture properties. When making such adjustments, verify your adjustments apply to the selected input. Otherwise, your adjustments apply to all the input sources listed.<br>*Note: The capture properties remain available regardless of whether the encoder starts or remains idle.* |
| **Gamma Correction** | The Gamma Correction field enables you to adjust the gamma of the incoming video. See Gamma Correction for more information.<br>• Gamma correction applies to all filters and all output pins on each device.<br>• You can have different gamma corrections for different physical devices. |

| | |
|---|---|
| **Tuning Utilities** | Click **Tuning Utilities** to access tuning utilities for a selected card. Refer to *Tuning Utilities* for additional diagnostics information. |
| **Restore Defaults** | Click **Restore Defaults** to restore the system to the factory defaults. |
| **Video Type** | Select the video type from the drop-down list. |
| **Bitrate (kbps)** | Enter the bitrate. |
| **Frame Rate** | Enter the frame rate. |

# Audio Settings tab

You no longer use the Audio Settings tab (Figure 69) to set the input source. Use the web interface for your Niagara system to set the input source for the selected audio devices. You can mute the audio and use the audio components on the Audio Settings tab.

**Figure 69. Audio Settings tab**

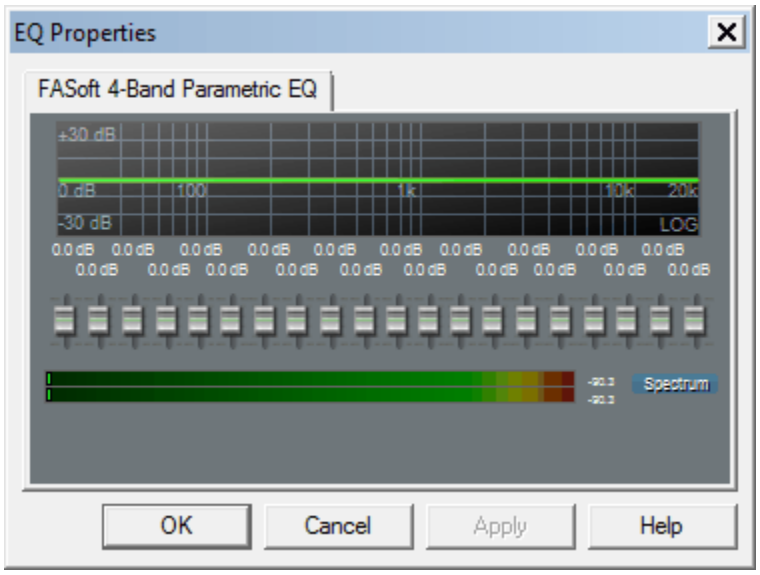



The Audio Settings tab has the following controls.

| | |
|---|---|
| **Input Source** | This field is not functional. |
| **Mute** | Select this field to mute the audio. |
| **Use Audio Components** | Select this field to enable the Audio Equalizer and Audio Compressor buttons. |
| **Audio Equalizer** | Click this button to display the EQ Properties window (see *EQ Properties window*). |
| **Audio Compressor** | Click on this button to display the Compressor Properties window (see *Compressor Properties window*). |
| **Audio Format** | Select the audio format from the drop-down list. |
| **Audio Type** | Select the audio type from the drop-down list. |
| **Bitrate** | Select the bitrate from the drop-down list. |

# EQ Properties window

**Figure 70. EQ Properties window**



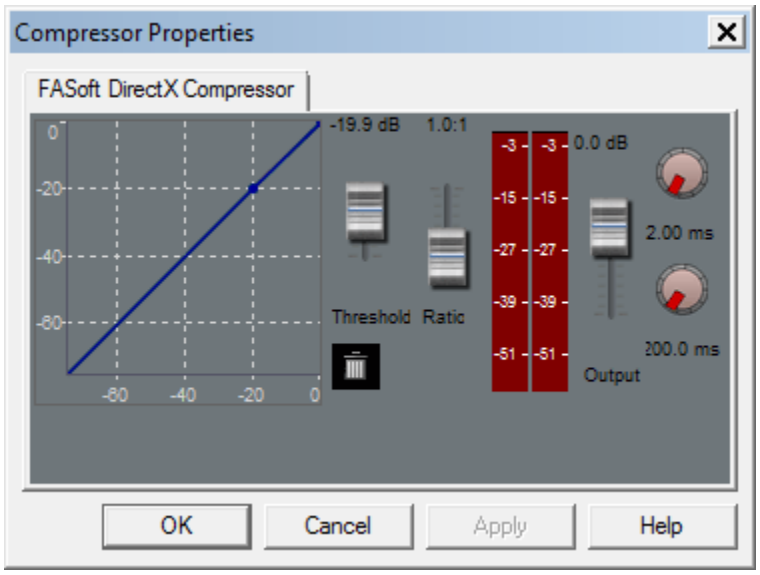

**To adjust the audio equalizer:**

1. Click on a band and slide it up or down to adjust the boost/cut at the specific frequency.
2. Click **OK** or **Apply** to set your changes.

   *Note: Click **Cancel** to cancel your changes and close the window.*
   *Click **Help** to access the user guide.*
3. Click on the graph to change the equalizer graph properties.

# Compressor Properties window

**Figure 71. Compressor Properties window**



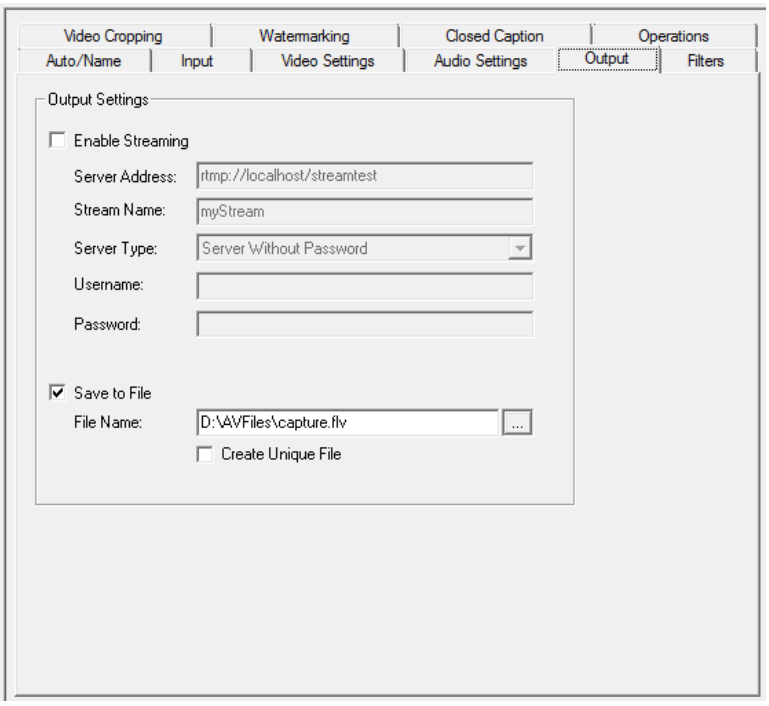

The Compressor Properties window has the following controls.

| | |
|---|---|
| **Dynamics graph plot** | Displays the settings as you adjust them. |
| **Threshold slider** | Click on the button and push up or down to adjust the threshold. |
| **Reset icon** | Click this icon to reset the dynamics graph plot |
| **Compression Ratio slider** | Click on this button and push up or down to adjust the compression. |
| **Output gain** | Click this button and push up or down to adjust the output. |
| **Attack time** | This clock indicates the attack time in milliseconds for the time it takes for the gain to increase by the output gain amount. |
| **Release time** | This clock indicates the release time in milliseconds for the time it takes for the gain to decrease by the output gain amount. |

# Output tab

Set the output destination on the Output tab (Figure 72).

**Figure 72. Output tab**




The Output tab has the following controls.

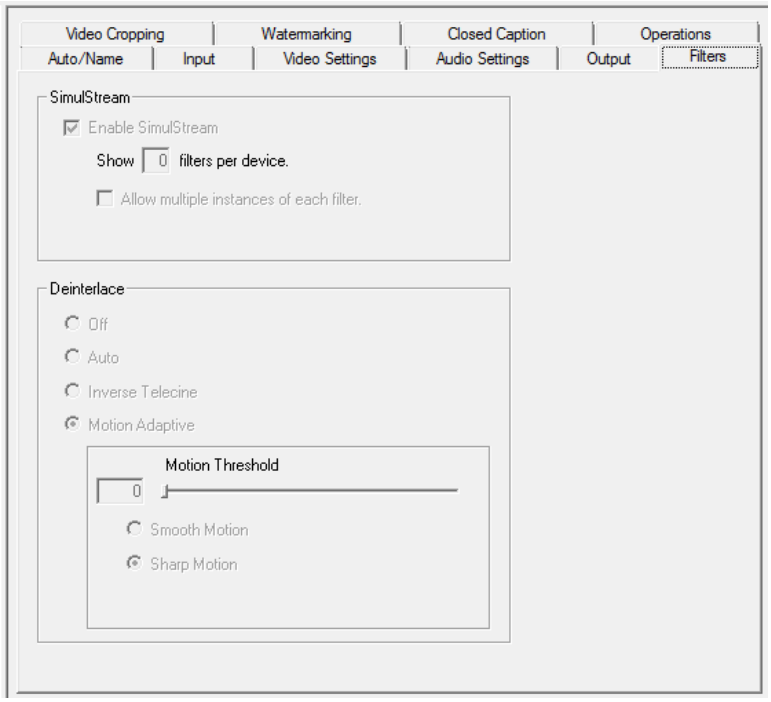
| | |
|---|---|
| **Enable Streaming** | Select this field to stream to a Flash Media Server. |
| **Server Address** | Enter the address for the server. |
| **Stream Name** | Enter the name of the stream. |
| **Server Type** | Enter the server name or IP address. |
| **Username** | Enter the user name. |
| **Password** | Enter the password. |
| **Save to File** | Click **Save to file** if you want to save the content to a file.<br>*Note: The encoder system references the file name and not the system running SCX Explorer.*<br>*Note: In order to save files that are compatible with applications such as Adobe® Premier Elements 9, you need to save the files as *.f4v. Enter the full filename in the **Save As** field (for example, filename.f4v).* |
| **File Name** | Click on the browse button at the end of the field to search for a file name.<br>*IMPORTANT! When Niagara SCX and SCX Explorer reside on different computers, always start your browse for files by clicking Network. Then* |

| | |
|---|---|
| | *work down or enter the entire file pathname beginning with the system name (such as \\fileserver\c\videos).*<br><br>*If you simply enter a file name, you may inadvertently browse your local computer when the media file resides on the remote computer.*<br>*Note: Remember the file name applies to the encoder and not the system currently running SCX Explorer.* |
| **Create Unique File** | Enable this field to create a file that the system does not overwrite. |

# Filters tab

Use the Filters tab (Figure 73) to enable SimulStream and deinterlacing. This tab is optional. See *Niagara SCX and SimulStream* for information on setting up a SimulStream session and filters. Also, see *Deinterlace* for information on telecine, inverse telecine, and motion adaptive deinterlace.

**Figure 73. Filters tab**




The Filters tab has the following controls.

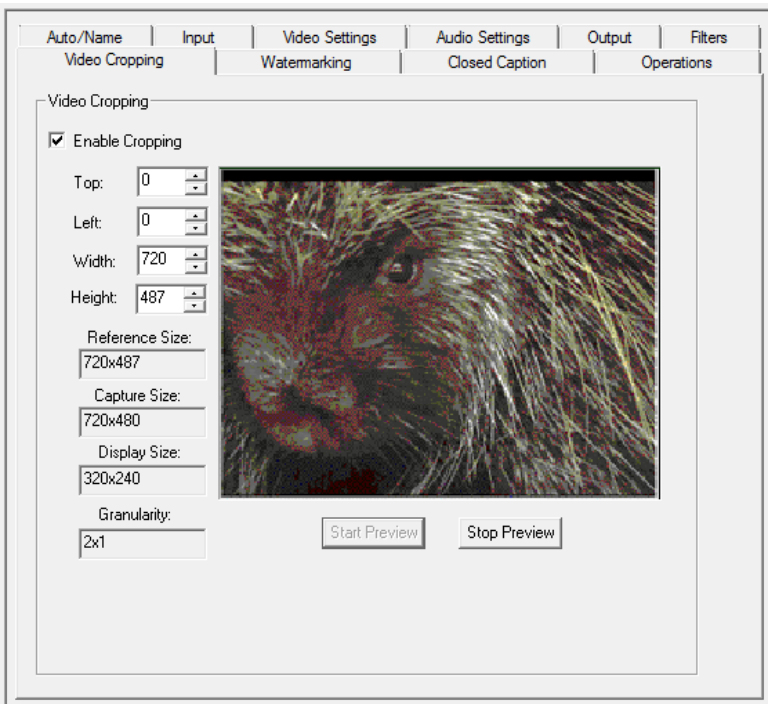
| | |
|---|---|
| **Enable SimulStream** | Select SimulStream. |
| **Show X filters per device** | Specify how many filters you plan to expose. |
| **Allow multiple instances of each filter** | Select this field to allow multiple video capture streams. |
| **Off** | Perform no deinterlacing of any kind. |
| **Auto** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Apply motion adaptive deinterlacing to video that is not telecine.<br>• Switch dynamically between the two modes as the content changes.<br>*Note: Available for NTSC video only.* |

| | |
|---|---|
| **Inverse Telecine** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Perform no deinterlacing of video that is not telecine.<br>*Note: Available for NTSC video only*. |
| **Motion Adaptive** | Apply motion adaptive deinterlacing to all video. |
| **Motion Threshold** | The Motion Threshold slider and edit box adjust the threshold of difference from spatially and temporally related pixels that are in motion. As you move the slider to the left, the number of motion pixels greatly increases until nearly the entire screen is in motion. The recommended default is 16. |
| **Smooth Motion** | The Smooth Motion option results in more loss of detail in motion areas, but edges are smoother. This algorithm uses a bit more CPU. |
| **Sharp Motion** | The Sharp Motion option makes detail in motion areas sharper, but at the expense of somewhat jagged diagonal edges. |

# Video Cropping tab

Use the Video Cropping tab (Figure 74) to set size and aspect ratio of chosen video output.

**Figure 74. Video Cropping tab**



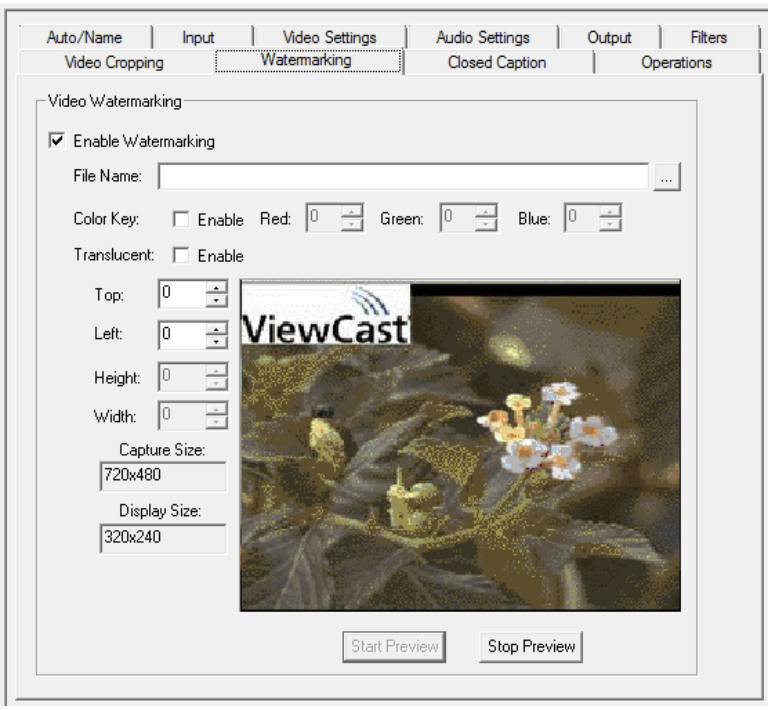

The Video Cropping tab has the following controls.

| | |
|---|---|
| **Enable Cropping** | When you select cropping, the system automatically switches the video size to FULL and the cropping measurements default to the FULL size.<br>From the **Top**, **Left**, **Width**, and **Height** settings, you can set a custom cropping size. |
| **Reference Size**<br>**Capture Size**<br>**Display Size**<br>**Granularity** | These fields refer to the size of the video. |
| **Start Preview** | Click this button to preview the video with your crop settings. |
| **Stop Preview** | Click this button to stop the preview. |

# Watermarking tab

Use the Watermarking tab (Figure 75) to place a watermarked graphic over your video output.

**Figure 75. Watermarking tab**



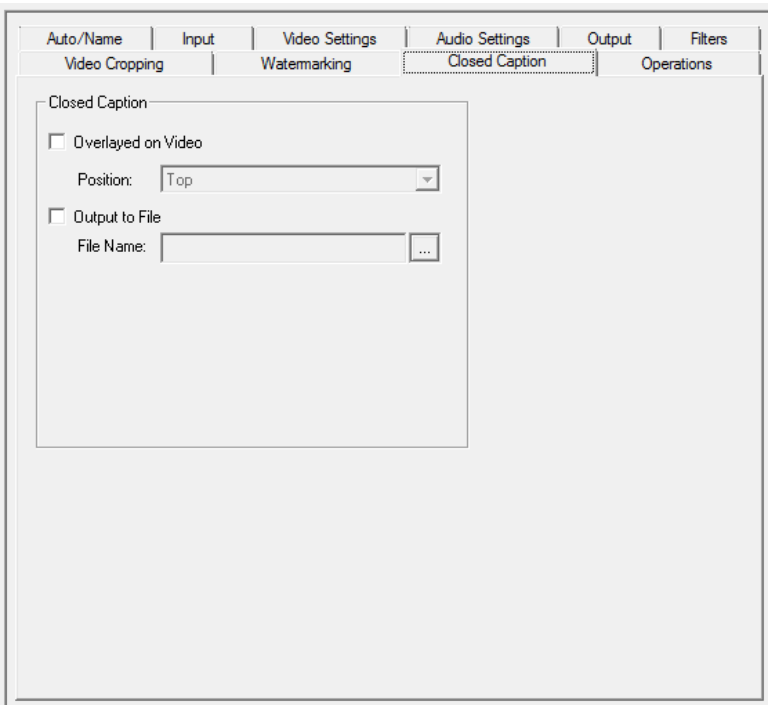

The Watermark tab has the following controls.

| | |
|---|---|
| **Enable Watermarking** | Select this field to place a watermarked graphic over your video output.<br>*Note: You can only watermark a 24-bit bmp. The system does not accept any other image formats.* |
| **File Name** | Click on the browse button at the end of the field to search for a file name of the graphic you want to use. |
| **Color Key** | Select this field to adjust the color balance, size, and opacity of the graphic. |
| **Translucent** | Select this field to render the graphic translucent. |
| **Top**<br>**Left**<br>**Height**<br>**Width** | Use these controls to adjust the location of the graphic. |
| **Capture Size** | Indicates the size of the capture. |
| **Display Size** | Indicates the size of the display. |
| **Start Preview** | Click this button to preview the watermark on the video. |
| **Stop Preview** | Click this button stop the preview. |

# Closed Caption tab

Use the Closed Caption tab (Figure 76) to adjust the position of closed caption text, if applicable, on video.

**Figure 76. Closed Caption tab**

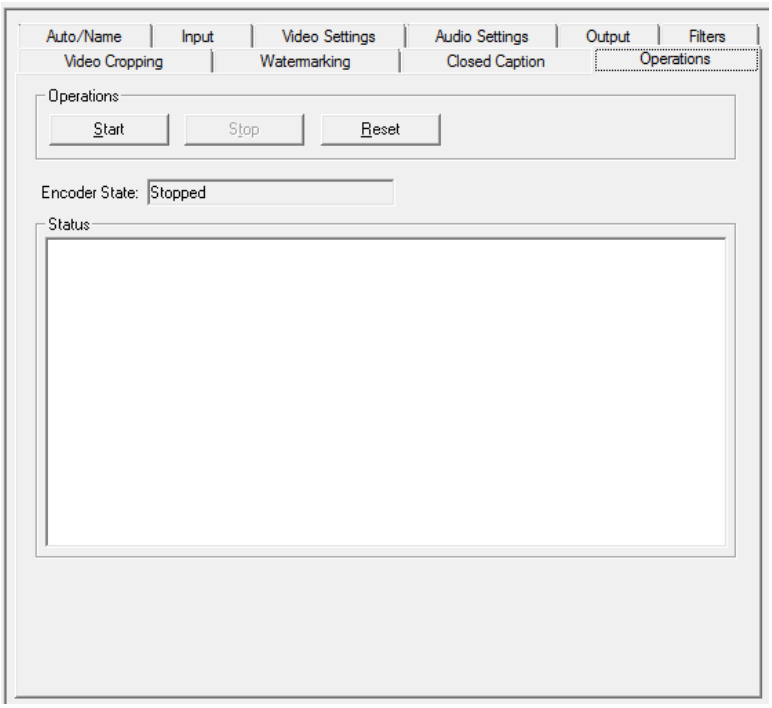



The Closed Caption tab has the following controls.

| | |
|---|---|
| **Overlayed on Video** | Select this field to overlay the closed caption text on the video stream. |
| **Position** | Select the position of the closed caption text from the drop-down list. |
| **Output to File** | Select this field to capture the closed caption text into a SAMI file. |
| **File Name** | Click the browse button at the end of the field to search for a file name.<br>*Note: The SAMI field path you enter must include a shared directory, partition, or drive.* |

# Operations tab

**Figure 77. Operations tab**




The Operations tab has the following controls.

| | |
|---|---|
| **Start** | Click this button to begin encoding. |
| **Stop** | Click this button to end the session. |
| **Reset** | Click this button to stop the restart an encoding session. |
| **Encoder State** | Indicates the status of the encoder (started, stopped). |
| **Status** | A progress report and error messages appear in the Status section of this window. |

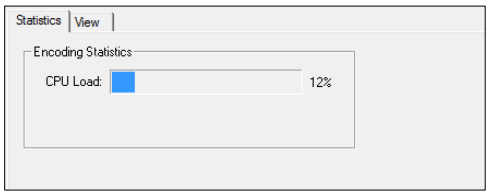
# Flash Streaming Options Tabs

The Flash streaming options tabs include Statistics and View.

## Statistics tab

Use the Statistics tab (Figure 78) to view the current CPU load.

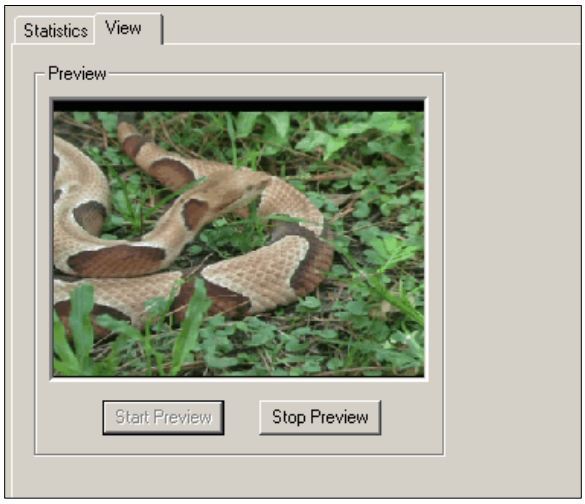
**Figure 78. Statistics tab**



# View tab

Use the View tab (Figure 79) to monitor the encoder output. To watch the incoming video or see the output video, you must have enabled Osprey SimulStream for the capture card. Osprey SimulStream enables a single card to produce multiple outputs. For more information or to purchase SimulStream for your Osprey capture card, visit http://viewcast.com/products/software/simulstream.

**Figure 79. View tab**




The View tab has the following controls.

| | |
|---|---|
| **Start Preview** | Click **Start Preview** to initiate the view following a buffer delay. |
| **Stop Preview** | Click **Stop Preview** to stop displaying the video immediately.<br>*Note: Playback stops automatically when you select another encoder.* |

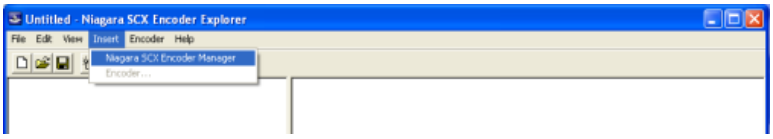
# MPEG-4 Options and Settings

MPEG-4 options are included on all Niagara appliances excluding single encode appliances.

**To access the MPEG4 encoder driver tabs:**

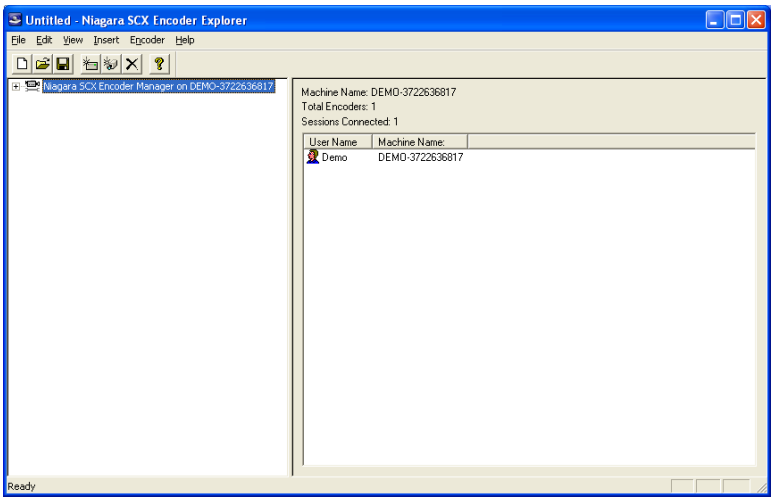
1. On the Niagara SCX window (Figure 80), click **Insert**.

**Figure 80. Niagara SCX Encoder Explorer**



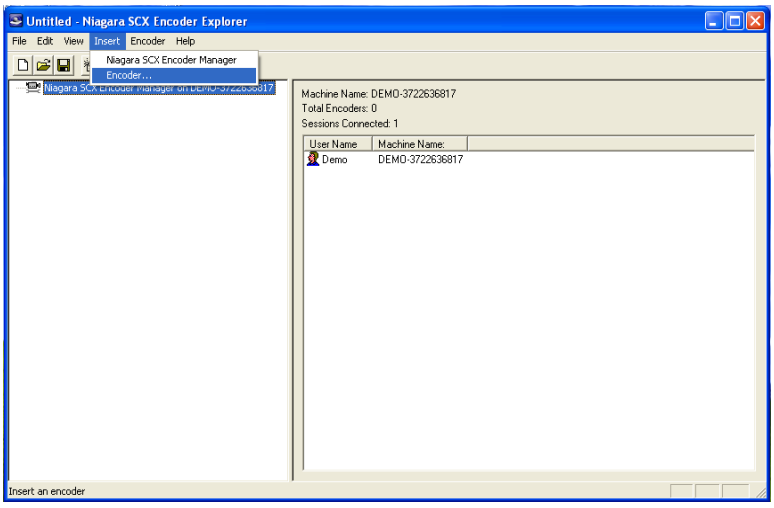

2. Click **Niagara SCX Encoder Manager**. The system displays your computer's name on the right-hand side of the window (Figure 81).

**Figure 81. Computer Name Display on Niagara SCX Encoder Explorer**



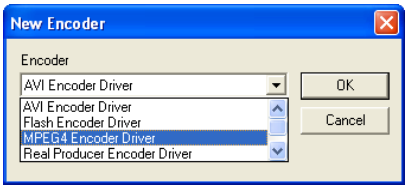

3. Click **Insert**.
4. Click **Encoder** (Figure 82).

**Figure 82. Insert, Encoder Option**



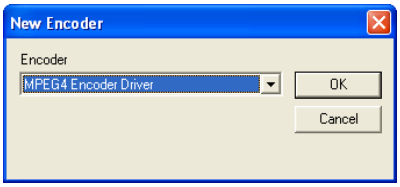

The system displays a set of options (Figure 83) for the type of encoder you want to create.

**Figure 83. Encoder Options List**



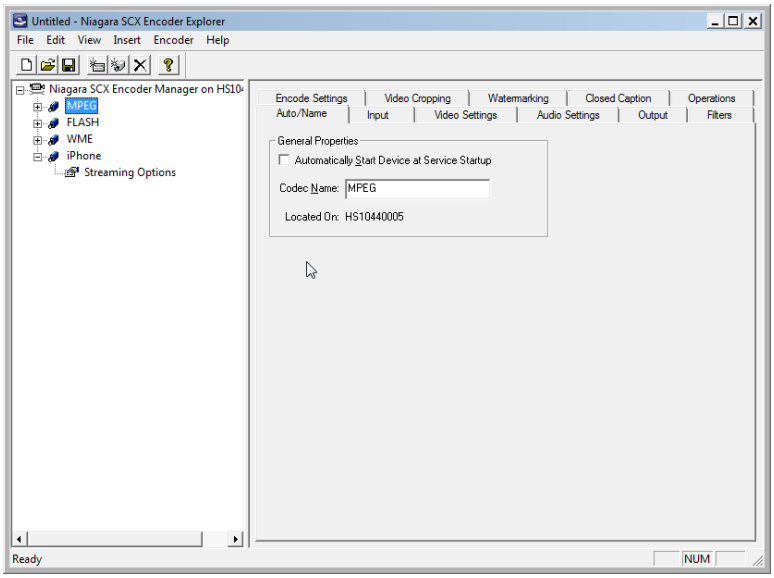

5. Click MPEG4 Encoder Driver.
6. Click **OK**. The system displays the **New Encoder** window Figure 84.

**Figure 84. MPEG4 Encoder Driver Selection**



# Auto/Name tab

**Figure 85. Auto/Name tab**



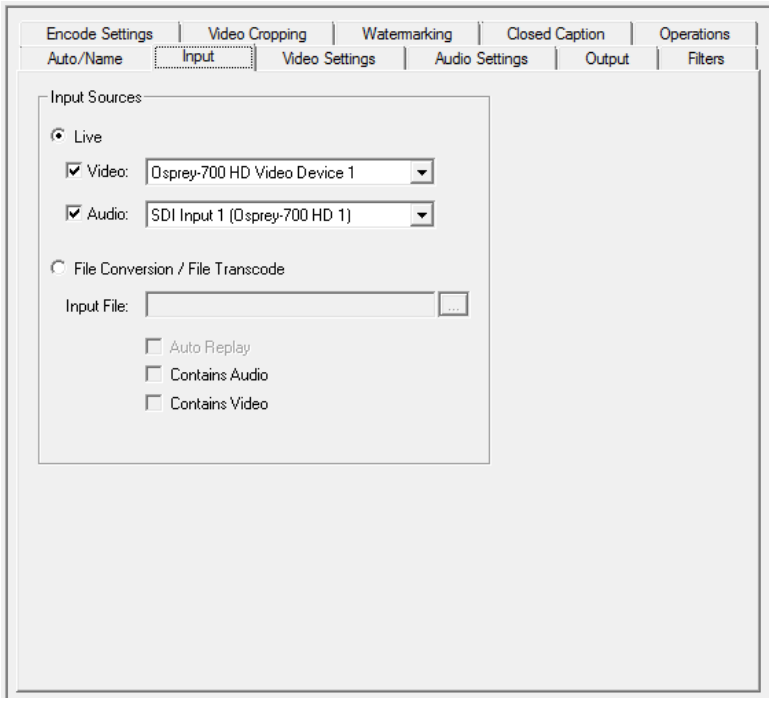

The Auto/Name tab has the following controls.

| | |
|---|---|
| **Automatically Start Device at Service Startup** | Select this field to start the encoder when the Niagara SCX service starts. |
| **Codec Name** | Enter the name of the encoder. |
| **Located On** | Indicates the name of the machine where the encoder resides. |

# Input tab

Use the Input tab (Figure 86) to set the input sources to use for Live or File Conversion/File Transcode.

**Figure 86. MPEG-4 Input Sources**




**To set the live input source:**

1. Click **Live**.
2. Click the video capture device in the **Video** field and select the audio device in the **Audio** field for live encoding.

   *Note: The system lists all known video and audio devices in drop-down menus.*

**To set file conversion:**

1. Click **File Conversion/File Transcode** to encode a previously recorded file (such as .avi or .wav files) into streaming format.
2. Click on the browse button at the end of **Input File** to search for a file name to insert. The Open window displays.

   *Note: Remember the file name applies to the encoder and not the system currently running SCX Explorer.*

   *IMPORTANT! When Niagara SCX and SCX Explorer reside on different computers, always start your browse for files at My Network Places. Then work down or enter the entire file pathname beginning with the system name (such as \\fileserver\c\videos).*

   *If you simply enter a file name, you may inadvertently browse your local*

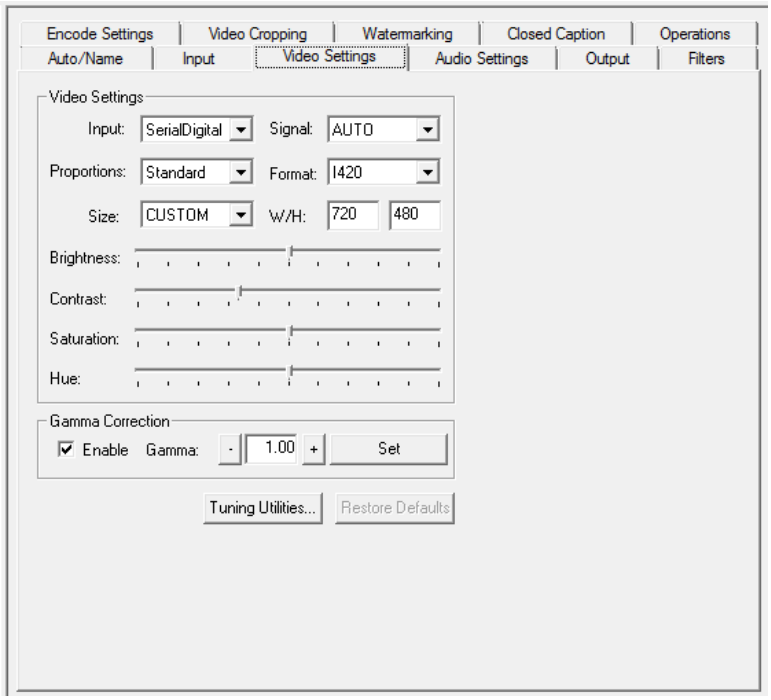
*computer when the media file resides on the remote computer*.

3. Click **Auto Replay** to replay the file automatically.
4. Click **Contains Audio** to indicate if the file contains audio.
5. Click **Contains Video** to indicate if the file contains video.

# Video Settings tab

Use the Video Settings tab (Figure 87) to control the capture properties for the selected video device.

**Figure 87. Video Settings**




The Video Settings tab has the following controls.

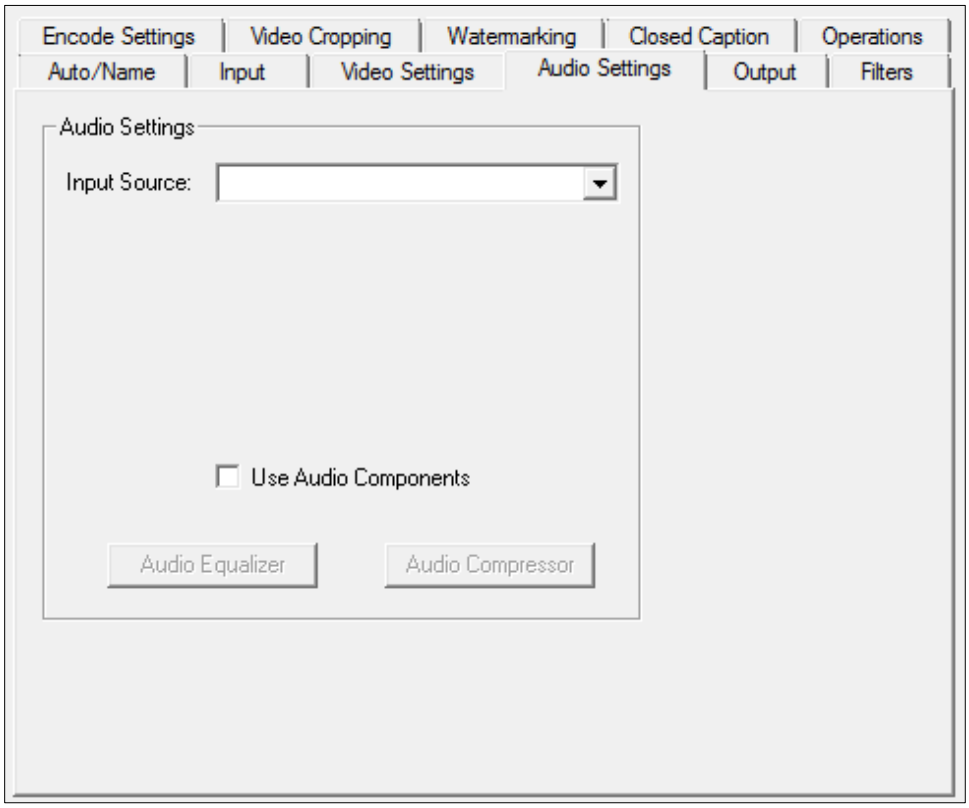
| | |
|---|---|
| **Input** | Select the input connectors available for the capture device from the drop-down list. |
| **Signal** | Select the video standard that the capture device supports from the drop-down list. |
| **Proportions, Size, W/H** | Use these fields to adjust capture properties such as proportion, video size, and width/height. |
| **Brightness, Contrast, Saturation, Hue** | Drag the slider to adjust additional capture properties. When making such adjustments, verify your adjustments apply to the selected input. Otherwise, your adjustments apply to all the input sources listed.<br>*Note: The capture properties remain available regardless of whether the encoder starts or remains idle.* |
| **Gamma Correction** | The Gamma Correction field enables you to adjust the gamma of the incoming video. See *Gamma Correction* for more information.<br>• Gamma correction applies to all filters and all output pins on each device.<br>• You can have different gamma corrections for different physical devices. |

| | |
|---|---|
| **Tuning Utilities** | Click Tuning Utilities to access turning utilities for a selected card. Refer to *Tuning Utilities* for additional diagnostics information. |
| **Restore Defaults** | Click Restore Defaults to restore the system to the factory defaults. |

# Audio Settings tab

You no longer use the Audio Settings tab (Figure 88) to set the audio input source. Use the web interface for your Niagara system to set the input source for selected audio devices.

**Figure 88. Audio Settings tab**

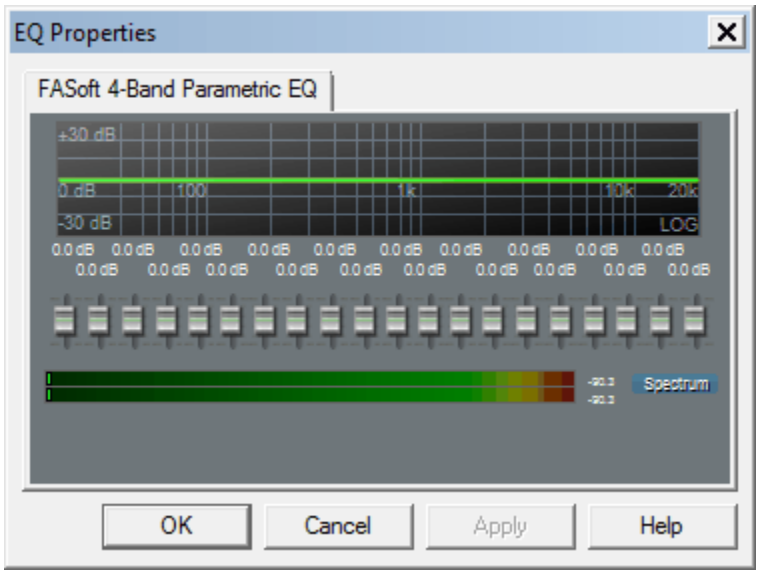



The Audio Settings tab has the following controls.

| | |
|---|---|
| **Use Audio Components** | Select this field to enable the Audio Equalizer and Audio Compressor buttons. |
| **Audio Equalizer** | Click this button to display the EQ Properties window (see *EQ Properties window*). |
| **Audio Compressor** | Click on this button to display the Compressor Properties window (see *Compressor Properties window*). |

# EQ Properties window

**Figure 89. EQ Properties window**



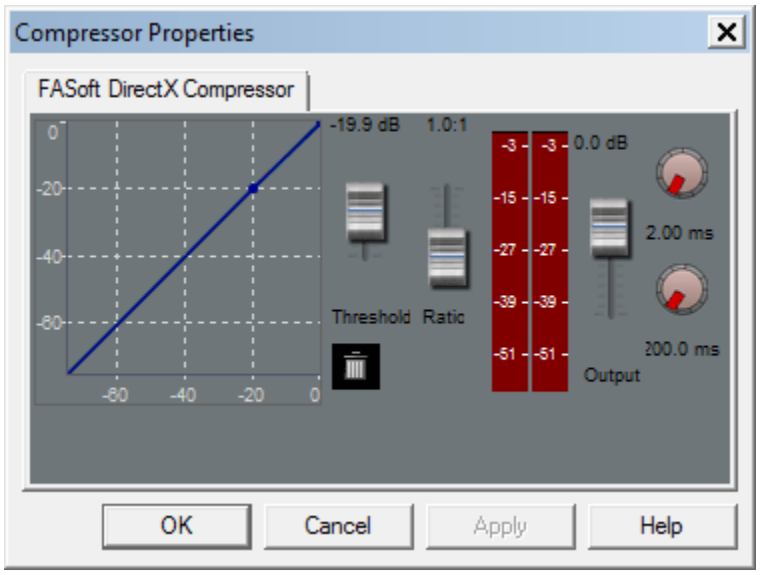

**To adjust the audio equalizer:**

1. Click on a band and slide it up or down to adjust the boost/cut at the specific frequency.
2. Click **OK** or **Apply** to set your changes.

   *Note: Click **Cancel** to cancel your changes and close the window.*
   *Click **Help** to access the user guide.*
3. Click on the graph to change the equalizer graph properties.

# Compressor Properties window

**Figure 90. Compressor Properties window**



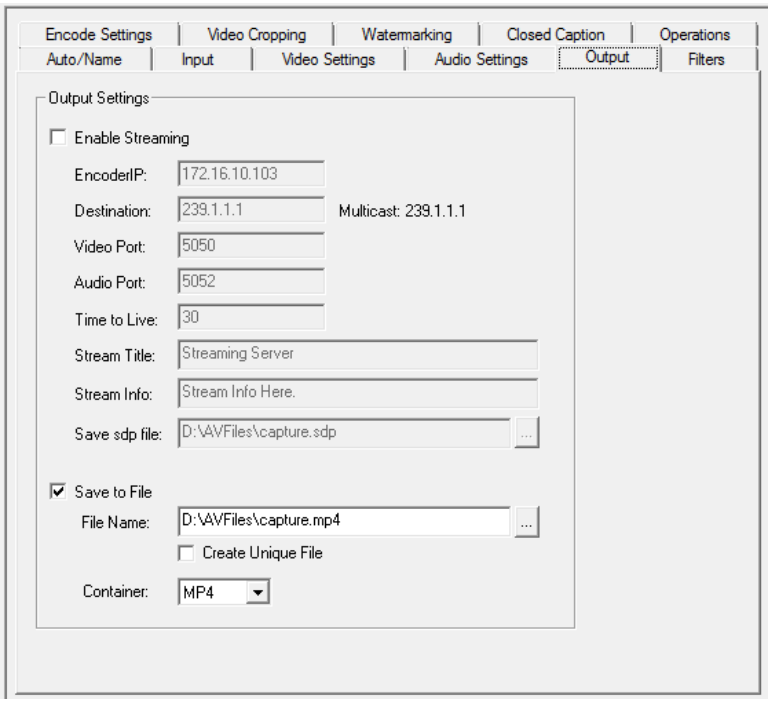

The Compressor Properties window has the following controls.

| | |
|---|---|
| **Dynamics graph plot** | Displays the settings as you adjust them. |
| **Threshold slider** | Click on the button and push up or down to adjust the threshold. |
| **Reset icon** | Click this icon to reset the dynamics graph plot |
| **Compression Ratio slider** | Click on this button and push up or down to adjust the compression. |
| **Output gain** | Click this button and push up or down to adjust the output. |
| **Attack time** | This clock indicates the attack time in milliseconds for the time it takes for the gain to increase by the output gain amount. |
| **Release time** | This clock indicates the release time in milliseconds for the time it takes for the gain to decrease by the output gain amount. |

# Output tab

You can set output options on the Output tab (Figure 91).

**Figure 91. Output tab**




The Output tab has the following controls.

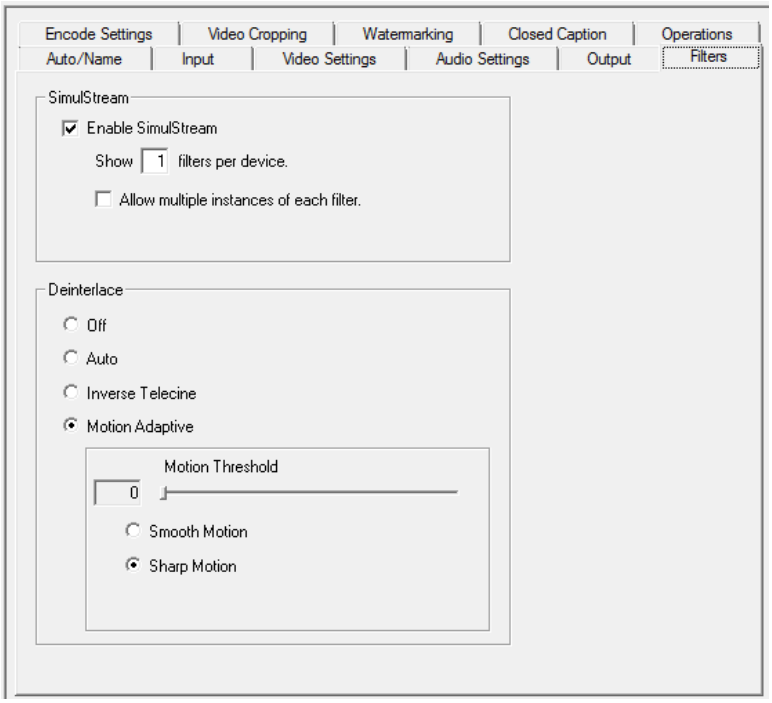
| | |
|---|---|
| **Enable Streaming** | Select this field to stream to a Flash Media Server. |
| **EncodeIP** | Enter the IP address. |
| **Destination** | Enter the destination. |
| **Video Port** | Enter the video port number. |
| **Audio Port** | Enter the audio port number. |
| **Time to Live** | Enter the seconds for time to live. |
| **Stream Title** | Enter the name of the stream. |
| **Stream Info** | Enter the stream information. |
| **Save sdp file** | Click on the browse button at the end of the field to browse for the sdp file. |
| **Save to File** | Click **Save to file** if you want to save the content to a file.<br>*Note: Remember the encoder system references the file name and not the system running SCX Explorer.* |
| **File Name** | Click on the browse button at the end of the field to browse for a file name.<br>*IMPORTANT! When Niagara SCX and SCX Explorer reside on different computers, always start your browse for files by clicking Network. Then work down or enter the entire file pathname beginning with the system* |

| | |
|---|---|
| | *name (such as \\fileserver\c\videos).*<br><br>*If you simply enter a file name, you may inadvertently browse your local computer when the media file resides on the remote computer.*<br>*Note: Remember the file name applies to the encoder and not the system currently running SCX Explorer.* |
| **Create Unique File** | Enable this field to create a file that the system does not overwrite. |
| **Container** | Select the container type from the drop-down list. |

# Filters tab

You can use the Filters tab (Figure 92) to enable SimulStream® and deinterlacing. This tab is optional. See *Niagara SCX and SimulStream* for information on setting up a SimulStream session and filters. Also, see Deinterlace for information on telecine, inverse telecine, and motion adaptive deinterlace.

**Figure 92. Filters tab**




The Filters tab has the following controls.

| | |
|---|---|
| **Enable SimulStream** | Select SimulStream. |
| **Show X filters per device** | Specify how many filters you plan to expose. |
| **Allow multiple instances of each filter** | Select this field to allow multiple video capture streams. |
| **Off** | Perform no deinterlacing of any kind. |
| **Auto** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Apply motion adaptive deinterlacing to video that is not telecine.<br>• Switch dynamically between the two modes as the content changes.<br>*Note: Available for NTSC video only.* |

| | |
|---|---|
| **Inverse Telecine** | • Apply inverse telecine deinterlacing to all telecine video.<br>• Perform no deinterlacing of video that is not telecine.<br>*Note: Available for NTSC video only*. |
| **Motion Adaptive** | Apply motion adaptive deinterlacing to all video. |
| **Motion Threshold** | The Motion Threshold slider and edit box adjust the threshold of difference from spatially and temporally related pixels that are in motion. As you move the slider to the left, the number of motion pixels greatly increases until nearly the entire screen is in motion. The recommended default is 16. |
| **Smooth Motion** | The Smooth Motion option results in more loss of detail in motion areas, but edges are smoother. This algorithm uses a bit more CPU. |
| **Sharp Motion** | The Sharp Motion option makes detail in motion areas sharper, but at the expense of somewhat jagged diagonal edges. |

# Encode Settings tab

The Encode Settings tab provides options for basic settings for the video and audio options of MPEG-4. The Niagara SCX software MPEG-4 compression engine provides baseline encoding functionality for:

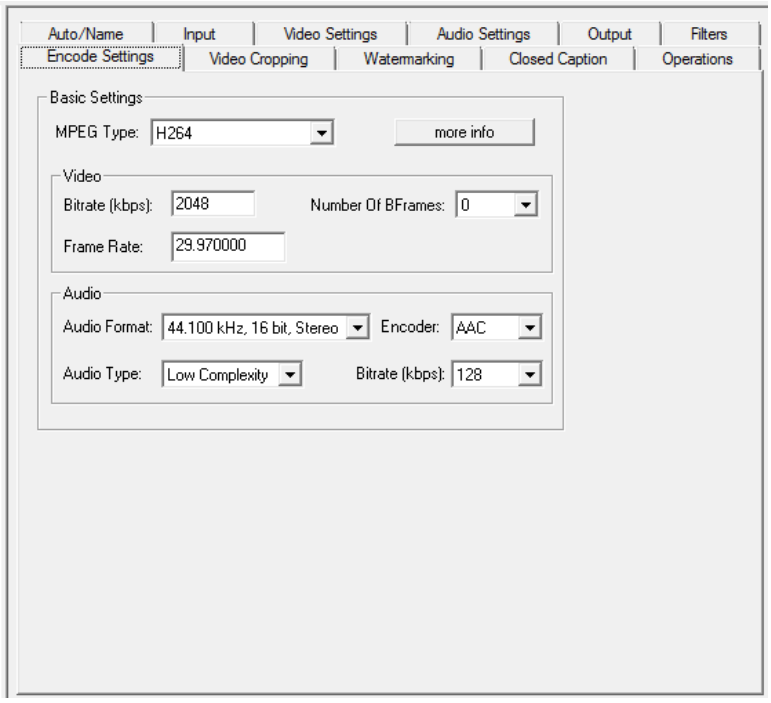
- H.263
- MPEG-4 Part 2 SP/ASP
- H.264/MPEG-4 Part 10

It allows you to encode streams for:

- Internet video
- Mobile phones
- Set top boxes

Use the Encode Settings tab (Figure 93) to create media files for other MPEG-4 compatible devices such as iPods.

**Figure 93. Encode Settings tab**



The Encode Settings tab has the following controls.

# Basic Settings

The **MPEG Type** drop-down list provides you with a drop-down list that includes the following choices:

- H.264 – MP4, H.264, MPEG-4, Part 10 or Advanced Video Coding (AVC) - Accommodates very high data compression while maintaining better quality than its predecessor. Created to address a broad range of applications from low bit rate to high bit rate and from low resolution such as cell phones to high resolution such as broadcast. The Niagara SCX H.264 is baseline profile.
- MPEG-4, Part 2, or H.263 - Applies to situations where other conditions of the applications, like network bandwidth or device size, mandate low bit rate and low resolution. Examples of video applications for H.263 include cell phones, some low-end video conferencing systems, and surveillance systems. H.263 remains important for legacy handheld devices that do not support H.264.
- H.263 – MP4 MPEG-4, Part 2, or H.263 - For situations where other conditions of the applications, like network bandwidth or device size mandate low bit rate and low resolution. Examples of video applications for H.263 include cell phones, some low-end video conferencing systems, and surveillance systems. H.263 remains important for legacy handheld devices that do not support H.264.

  *Note: By default, the Niagara SCX H.263 uses **Simple Profile** unless you select the **Enable B Frames** option. If you enable B frames, the resulting stream becomes Advanced Simple Profile.*
- H.263 – 3G2 - Creates an H.263 stream stored in a 3G2 container.
- H.263 – 3GP - Creates an H.263 stream stored in a 3GPP container.
- MPEG4 – 3GP - Exemplifies a multimedia container format defined by the Third Generation Partnership Project (3GPP) for use on 3G mobile phones. It stores video streams such as MPEG-4 or H.264 and audio streams such as AAC. Creates an H.263 stream stored in a 3GPP container. The two defined standards for this format include:
  - *3GPP for GSM based mobile phones*
  - *3GPP2 for CDMA based mobile phones*
- H.264 – 3G2 - Creates an H.264 stream stored in a 3G2 container.
- H.264 – 3GP - Creates an H.264 stream stored in a 3GPP container.

Click **more info** to view help for this topic.

# Video

| | |
|---|---|
| **Bitrate (kbps)** | Enter the bitrate. |
| **Number Of BFrames** | Choose the number of B frames. B frames improve coding efficiency by using forward and backward prediction. They also can increase latency and require more computational power in encode and decode processes. If your resulting stream has quality issues on playback, try disabling B frames to ensure compatibility with most players. |
| **Frame Rate** | Enter the frame rate. |

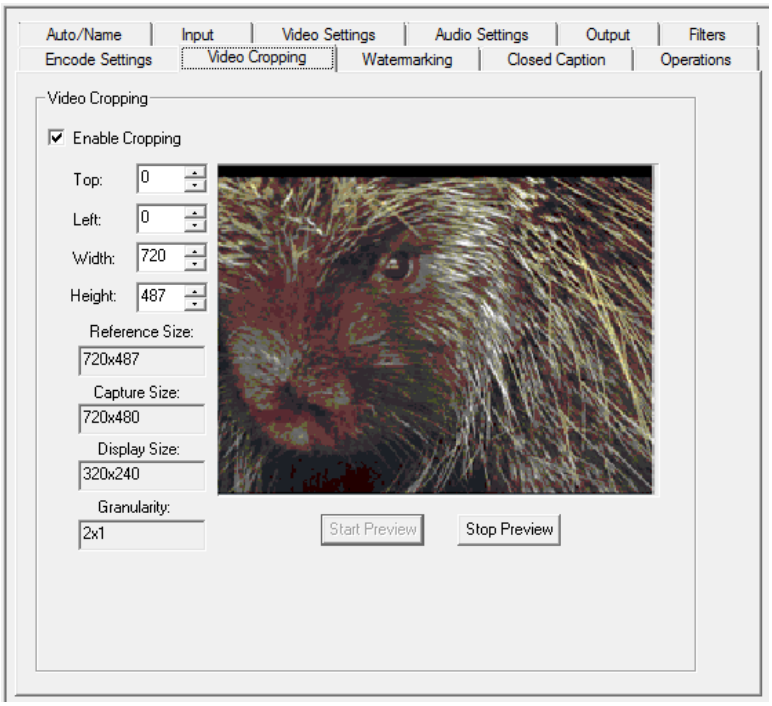
# Audio Format

| | |
|---|---|
| **Audio Format** | Select the audio format from the drop-down list. |
| **Encoder** | Select the encoder from the drop-down list. |
| **Audio Type** | Select Main or Low Complexity from the drop-down list.<br>• Low Complexity (LC) - The simplest and most widely used and supported AAC audio format.<br>• Main Profile (MAIN) - The same format as LC (above) with an added backward prediction.<br>*Note: Depending on the player where you intend to hear the resulting stream, either choice uses a specific set of tools to encode the audio stream.*<br><br>*You should make your choice based on the requirement of the playback software or device.*<br><br>*The most widely supported format is LC profile.* |
| **Bitrate (kbps)** | Select the bitrate from the drop-down list. |

# Video Cropping tab

Use the Video Cropping tab (Figure 94) to set the size and aspect ratio of your chosen video output.

**Figure 94. Video Cropping tab**



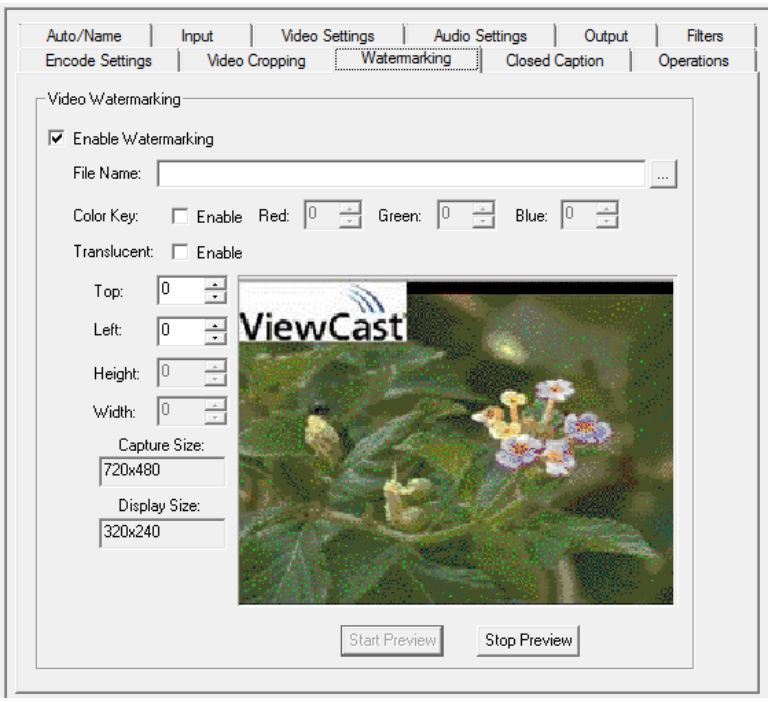

The Video Cropping tab has the following controls.

| | |
|---|---|
| **Enable Cropping** | When you enable cropping, the system automatically switches the video size to FULL and the cropping measurements default to the FULL size.<br>From the **Top**, **Left**, **Width**, and **Height** settings, you can set a custom cropping size. |
| **Reference Size**<br>**Capture Size**<br>**Display Size**<br>**Granularity** | These fields refer to the size of the video. |
| **Start Preview** | Click this button to preview the video with your crop settings. |
| **Stop Preview** | Click this button to stop the preview. |

# Watermarking tab

Use the Watermarking tab (Figure 95) to place a watermarked graphic over your video output.

**Figure 95. Watermarking tab**



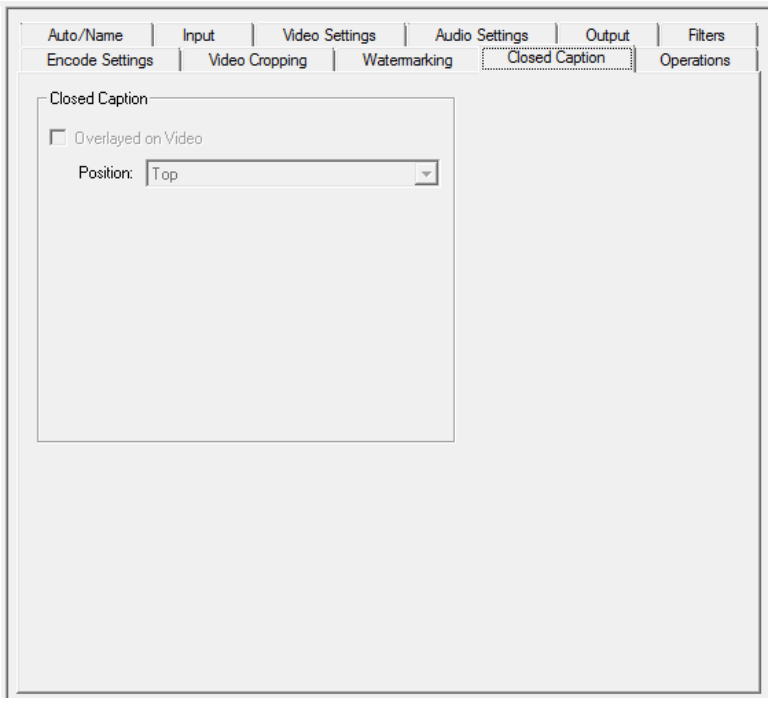

The Watermark tab has the following controls.

| | |
|---|---|
| **Enable Watermarking** | Select this field to place a watermarked graphic over your video output.<br>*Note: You can only watermark a 24-bit bmp. The system does not accept any other image formats.* |
| **File Name** | Click on the browse button at the end of the field to search for a file name of the graphic you want to use. |
| **Color Key** | Select this field to adjust the color balance, size, and opacity of the graphic. |
| **Translucent** | Select this field to render the graphic translucent. |
| **Top**<br>**Left**<br>**Height**<br>**Width** | Use these controls to adjust the location of the graphic. |
| **Capture Size** | Indicates the size of the capture. |
| **Display Size** | Indicates the size of the display. |
| **Start Preview** | Click this button to preview the watermark on the video. |
| **Stop Preview** | Click this button stop the preview. |

# Closed Caption tab

Use the Closed Caption tab (Figure 96) to adjust the position of closed caption text, if applicable, on your video feed.

**Figure 96. Closed Caption tab**

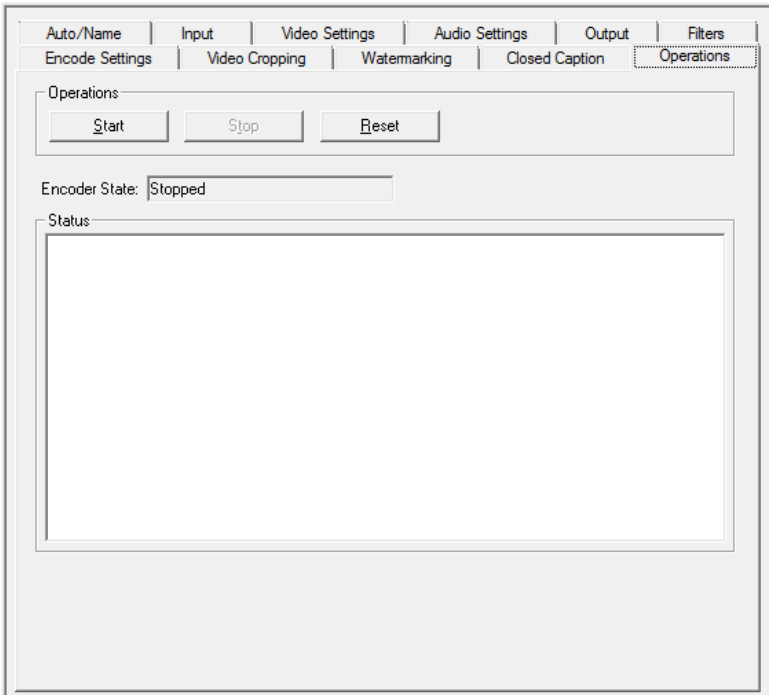



The Closed Caption tab has the following controls.

| | |
|---|---|
| **Overlayed on Video** | Select this field to overlay the closed caption text on the video stream. |
| **Position** | Select the position of the closed caption text from the drop-down list. |

# Operations tab

**Figure 97. Operations tab**




The Operations tab has the following controls.

| | |
|---|---|
| **Start** | Click this button to begin encoding. |
| **Stop** | Click this button to end the session. |
| **Reset** | Click this button to stop the restart an encoding session. |
| **Encoder State** | Indicates the status of the encoder (started, stopped). |
| **Status** | A progress report and error messages appear in the Status section of this window. |

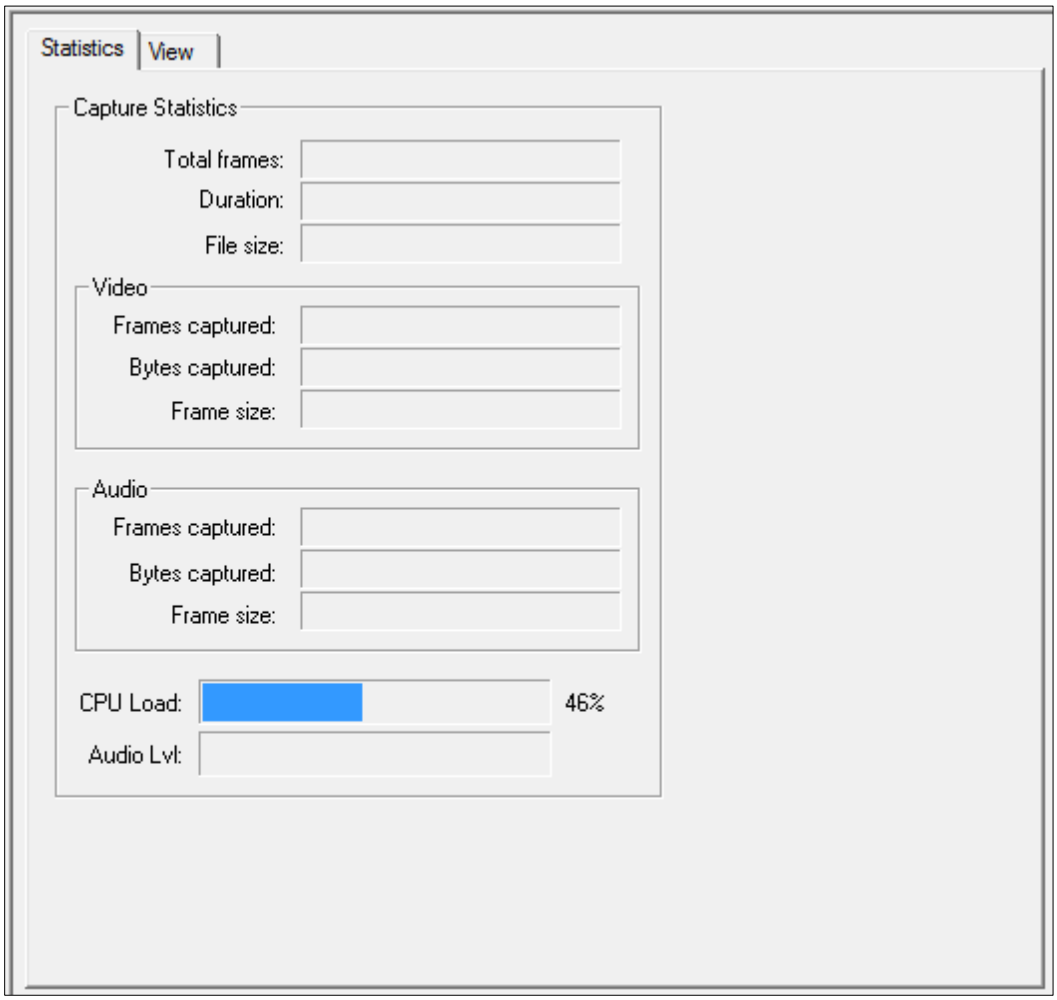
# MPEG-4 Streaming Options tabs

The MPEG-4 streaming options tabs include Statistics and View.

## Statistics tab

Use the Statistics tab (Figure 98) to view the current CPU load.

**Figure 98. Statistics tab**



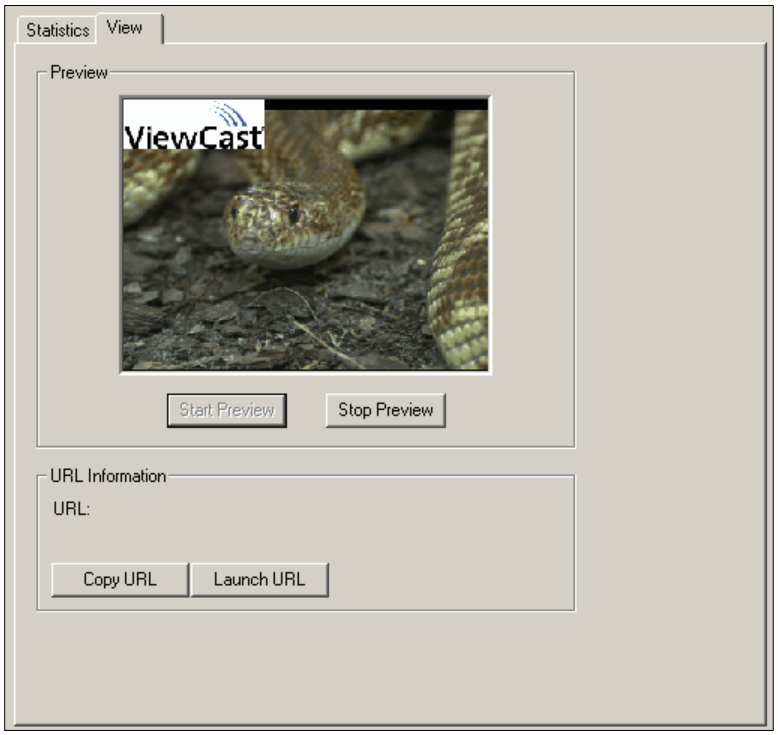

The Statistics tab has the following controls.

| | |
|---|---|
| **Capture Statistics** | Displays the total number of frames, the duration, and file size. |
| **Video** | Displays the number of video frames captured, bytes captured, and frame size. |
| **Audio** | Displays the number of audio frames captured, bytes captured, and frame size. |
| **CPU Load** | Displays the CPU load. |
| **Audio Lvl** | Displays the audio level. |

# View tab

Use the View tab (Figure 99) to preview videos as you encode. To watch the incoming video or see the output video standards, you must have installed Osprey SimulStream for the capture. Osprey SimulStream lets a single card produce multiple outputs. For more information or to purchase SimulStream for your Osprey video capture card, visit http://viewcast.com/products/software/simulstream.

**Figure 99. View tab**




The View tab has the following controls.

| | |
|---|---|
| **Start Preview** | Click **Start Preview** to initiate the view following a buffer delay. |
| **Stop Preview** | Click **Stop Preview** to stop displaying the video immediately.<br>*Note: Playback stops automatically when you select another encoder.* |
| **URL Information** | Displays the URL information. |
| **Copy URL** | Click this button to copy the URL. |
| **Launch URL** | Click this button to launch the Windows Media Player to view the stream. |

# Niagara SCX and SimulStream

Niagara SCX and SimulStream represent the perfect team of tools for maximizing resources for encoding purposes. With just one capture card, you can encode a single source into multiple outputs. Examples include using a single video that you can encode in Adaptive, Flash, MPEG-4, and Windows Media. You can encode these simultaneously by using SimulStream. SimulStream allows you to take a single input and encode in different formats and/or bitrates simultaneously.

Because there is only one input when using SimulStream, you establish each encoding output as an encoder in the SCX Explorer.

## Setting up a SimulStream session

**To set up a SimulStream session:**

1. Connect to the Niagara SCX Encoder Manager service.
2. Insert the desired encoder type you wish to run on the server.
3. Enter a name to identify the encoder.
4. Click on the video and audio input for this encoder on the Input tab.

   *Note: This could also be a file requiring conversion to a streaming format.*

   *Use the same video input for each output. If you have multiple boards in the system, select the same board for each output desired.*
5. Configure the video and audio settings, if needed, on the Video and Audio Settings tab.

   *Note: Repeat steps 4 and 5 for each output, for example, Flash and Windows Media. There is only one input but two outputs.*
6. Click on the output in the Output tab.

   *Note: On the second Output tab, establish the target audience.*

   *Windows Media Encoder has only one Output tab. It contains both the target audience and information for saving the video to a file.*
7. If required, enter the author and copyright information on the Author Info tab under the Streaming Options for the encoder.
8. To view a preview of the video, click the View tab under the Streaming Options.

   *Note: Steps 7 and 8 are optional.*
9. Click **Start** on the Operations tab to begin encoding.
10. To view the statistics for the encoding session, click **Streaming Options.**
11. Click on the various tabs to see information about the encoding session.

*WARNING! If you enable or disable SimulStream after you save an encoder profile, you could disable the profile you saved.*

*For instance, if you save a profile using Capture Device 1, then enable SimulStream, Niagara SCX no longer recognizes Capture Device 1 but sees Capture Device(s) 1.n instead.*

*You see a red X designating a non-recognized capture device by that profile and must reselect your input device to Capture Device 1.n to clear the red X and use the profile.*

# Filters

From a practical point of view, filters have two interrelated purposes:

- They allow applications to enumerate and list DirectShow video capture and preview pins or streams (each with different settings) as named entries in their video device select list.
  - *You can set up the driver to show 1 to 9 filters per device.*
  - *Each filter has one preview pin and one capture pin.*
  - *Standard applications can access a particular filter without any custom programming specialized for Osprey devices.*
- Each filter has independent settings for cropping, default output size, watermarks, and captions that you can store between sessions.

  *Note: Compared to the previous pin-based method, no requirements exist for a particular startup order, to associate settings with instantiations.*

If you are familiar with GraphEdit, you can best visualize SimulStream filters where you:

- Construct a multifilter graph with GraphEdit.
- Apply different crop, watermark, and caption settings to each filter.

# Enable check box

The check box at the top of the group (Figure 100) turns on SimulStream for the currently selected device. The following table indicates the conditions for SimulStream.

**Figure 100. SimulStream check box**

**Conditions for SimulStream**

| When… | Then… |
|---|---|
| you have a full SimulStream license installed, | select this check box to control full SimulStream. |
| you have a SimulStream license installed but have not turned SimulStream on, | the text shows SimulStream as *enabled.* |
| you have not purchased a SimulStream license, | select this check box to control SimulStream evaluation mode. |
| you clear the **Enable** check box, | the text line at the top of the control group indicates an *installed* SimulStream evaluation mode. |
| you select the **Enable** check box | the text indicates that SimulStream evaluation mode is *enabled*. |

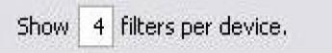
A message box prompts you to restart the system when you change the SimulStream **Enable** status and click **Apply** or **OK**. ViewCast strongly recommends that you do so. If you do not, SimulStream may partly work but the filter names and their pins may remain incorrect without a restart.

When you enable SimulStream (or SimulStream evaluation mode), the driver always works in *Postprocessing* mode, as described in the mode control group. In this case, the system forces the mode control to *Postprocessing* mode and disables the *Direct* mode control.

# Show *N* filters per device

With the **Show *N* filters per device** control (Figure 101) you can set up the driver to expose 1 to 9 filters per device for applications to specify and select. If, for example, you choose four filters per device, device lists in applications show four entries for the current device. For device 1, the system designates them as 1.1, 1.2, 1.3, and 1.4.

**Figure 101. Show filters per device**




This global setting affects all the Osprey-2XX, -300, -440 or -530/540/560 devices as a group.

*IMPORTANT! When you apply this change, a message box prompts you to restart the system. You must do this. The number of filters you request do not display or work correctly until you restart the system.*

While it is possible to expose and specify up to 9 filters per device, the practical number of working filters equates to less than this. The practical number of filters depends on:

- Capability of the system
- Types of filtering turned on in the driver
- Types of scaling and color format conversions requested in the driver
- Type of processing the downstream application performs

When you directly render video to the window, the video format and type of renderer used can make a major difference in system performance and in the number of possible streams. If multiple capture devices exist in the system, the number of filters equals the total across all the devices. In addition, some types of processing, such as de-interlacing and gamma correction, performed once per device may occur multiple times. A high-end, multi-core, or multiprocessor system can support 5, 6, or more concurrent filters on one device if the processing per filter remains light; but only 2 or 3 if the processing loads inside or outside of the driver becomes particularly heavy.

# Allow multiple instances of each filter

This control enables you to run multiple application instances on one device that does not have device select controls.

ViewCast recommends that you do *not* allow multiple instances of each filter unless you have a specific need for it. Turning it on affects some of the above description. Specifically, you cannot keep crop, watermark, and caption settings separately for applications sharing a filter, and might confuse and interfere with each other. The most recent crop, watermark, or caption setting corresponds to the saved one – it overwrites settings that you might previously have saved from another application.

This global setting affects all the Osprey 2XX, 300, 400 or 530/540/560 devices as a group.

When you apply this change, a message box prompts you to restart the system. This change does not work correctly until you do so.

Deinterlace, inverse telecine and gamma correction when set, affect all SimulStream instances on that specific Osprey card. In other words, all filters on the device and must have the same settings.

You can set crop, watermark, and caption settings differently for each pin of each filter. The driver also saves settings between sessions separately for each filter.

You can set video size, color format, and frame rate differently for each pin. The application must save these settings.

# Deinterlace

This option removes *artifacts* that the system can introduce when encoding NTSC, PAL, or SECAM formatted video. These artifacts usually manifest as a jaggedness surrounding a moving object.

You apply and store these filters per each device. Applies to all filters and pins associated with a specific device. Includes four radio button options:

- Off – disallows interlacing
- Motion Adaptive - applies motion adaptive interlacing to all video
- Inverse Telecine - applies inverse telecine deinterlacing to all telecine video
  - *It performs no deinterlacing of non-telecine video.*
  - *It is available for NTSC video only.*
- Auto - applies inverse telecine deinterlacing to all telecine video.
  - *It applies motion adaptive deinterlacing to all non-telecine video.*
  - *It switches dynamically between the two modes as the content changes.*
  - *It is available for NTSC video only.*

## Telecine

NTSC video is created originally on 24-frame-per-second film. It repeats certain fields in a regular, recurring sequence in the telecine conversion process. It also provides visible interlacing artifacts if you view a telecined sequence on a progressive window. Telecine only applies to NTSC video. It is not used for PAL and SECAM video. If you select PAL or SECAM as the video standard, you disable telecine. Telecine represents the film-to-video conversion process.

## Inverse telecine

Inverse telecine is the reverse of telecine. It drops redundant fields and reassembles video in a 24 fps progressive format. It removes 100% of interlacing artifacts.

When you view video at 24 fps, you see the exact timing and sequence on the original film. When you view video at 30 fps, the system repeats every fifth frame and eliminates de-interlacing artifacts.

Inverse telecine only applies to NTSC video. It is not used for PAL and SECAM video. If you select PAL or SECAM as the video standard, you disable inverse telecine. The inverse-telecine filter looks for frames added during a telecine process and removes them. This eliminates redundant encoding and improves the quality of encoded frames.

# Motion adaptive deinterlace

Motion adaptive deinterlace is the reverse of telecine. It is an algorithm for deinterlacing pure video (non-telecine) content. It detects the portions of the image that remain still and the portions that remain in motion then applies different processing to each. Motion adaptive deinterlace allows you to set the Motion Threshold and Smooth Motion or Sharp Motion.

# Tuning Utilities

Some electrical signals convey television pictures. Cables then carry this video signal from one place to another. Along the way, the signal may pass through various pieces of equipment such as video tape machines, switchers, character generators, special effects generators, and transmitters. Any of this equipment can change or distort the signal in undesirable ways.

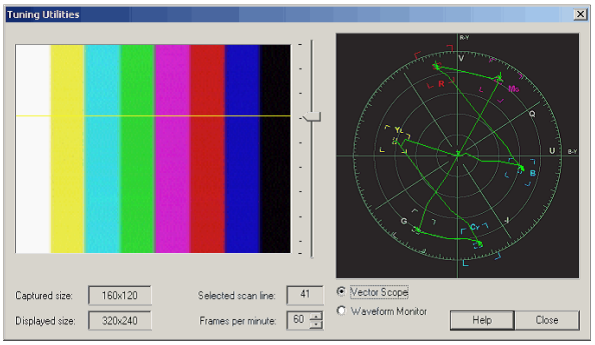
Because signal quality acts as a major determining factor for picture quality, you need to be able to detect and correct any signal distortions. The signal must be correct before the picture can be correct.

You can use a **waveform monitor** to measure luminance or picture brightness as well as a high frequency color signal called chrominance. You require an instrument called a **vectorscope** to control quality of video chrominance (coloring) especially in more complex systems.

## Vectorscope

A vectorscope displays (Figure 102) information about only the chrominance (coloring) portion of the video signal. It does not respond to other parts of the video signal.

**Figure 102. Vectorscope Display**




Two important parameters of the chrominance signal may suffer distortions leading to noticeable picture problems.

- **Amplitude** - Gain and phase (timing). Amplitude, an independent measurement, you can actually make with a waveform monitor.
- **Phase** - The relationship between the two signals. In this case, the relationship between the chrominance signal and reference burst on the video.

The processing within a vectorscope and the display of the processed signals readily detects and evaluates both phase and gain distortions of the chrominance.

# Understand the display

The vectorscope display has two parts: the graticule and the trace.

- **Graticule** - A scale you use to quantify the parameters of the signal under examination. Graticule works with a color bar signal.

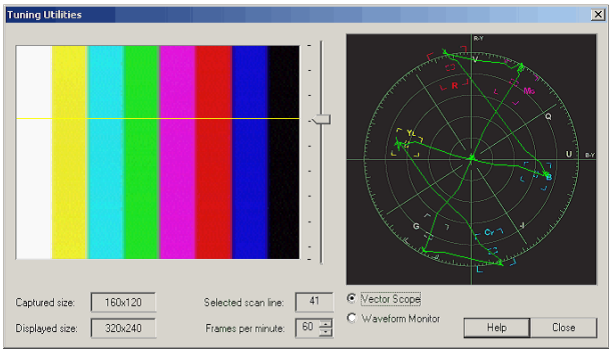
  *Note: Remember, the color bar's signal consists of brightness information (luminance) and high frequency color information (chrominance or chroma).*

- **Trace** - The video signal itself. The demodulated chrominance signals electronically generate it.

Each bar of the color bar's signal creates a dot on the vectorscope's display. The position of these dots remains relative to the boxes, or targets, on the graticule. The phase of the burst vector represents the major indicators of the chrominance (color) signal's health.

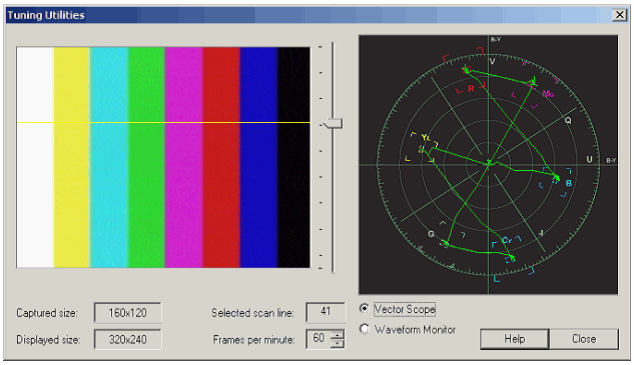
Within the circle, are six target shapes each containing smaller, sectioned shapes (Figure 103). The smaller shapes designate where each dot of the color bar's signal should fall if the chroma gain and phase relationships are correct.

**Figure 103. Vectorscope with Color Outside the Targets**




To adjust the source, adjust the saturation on the capture card until you have it positioned inside the targets (Figure 104).

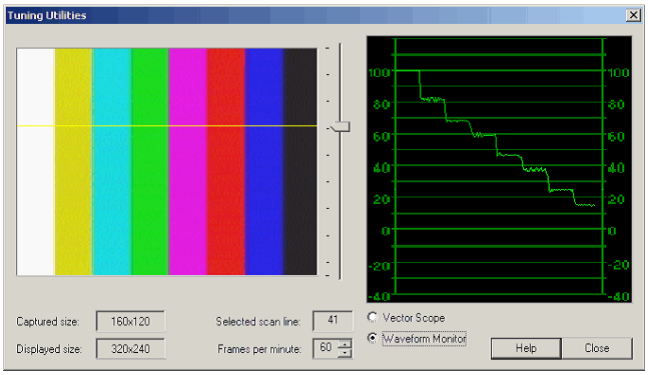
**Figure 104. Vectorscope Adjustments (Saturation)**



# Waveform monitor

Vectorscopes and waveform monitors (Figure 105) complement one another and provide a full representation of all information about the video signal.

**Figure 105. Waveform Monitor Display**




The nominal video signal level for television studios and production facilities equates to one volt (1 V) peak-to-peak.

> *Note: The term peak-to-peak means from the bottom of the signal to the top. You often see it abbreviated as p-p.*

Signals from different sources might not be compatible with each other without such an amplitude standard. This applies to a nominal signal, one that contains the brightest possible (peak white) picture information.

# Understanding the display

The waveform consists primarily of a brightness signal (called luminance) and a high-frequency color signal (called chrominance). The luminance and chrominance added together form the overall waveform.

The luminance signal, a series of voltages or *levels,* determines brightness and variations across the picture. Each of the colors in the color bars signal has a different luminance level, and bars arranged by level from highest to lowest (white, yellow, cyan, green, magenta, red, blue, and black).

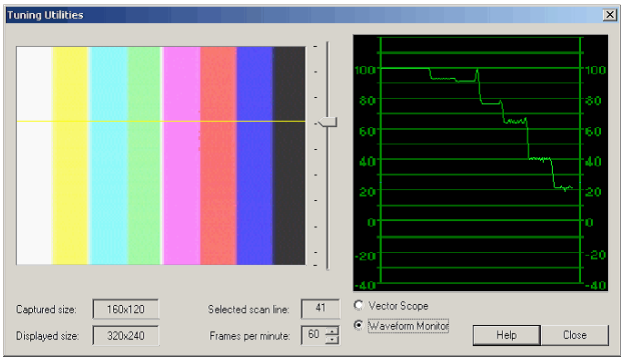
The chrominance signal is a sine wave. Because of this signal's high frequency, the sine wave cycles appear to run together in most displays. However, you can see individual cycles when you expand the display horizontally.

Color bar test signals fall into two general categories: 100% bars (full amplitude) or 75% bars (reduced amplitude).

> *Note: Always use 75% bars for basic testing because 100% bars contain signal levels that may be too high to pass through a system without distortion.*

Adjust the source by adjusting the brightness and/or contrast on the capture card until it resembles a flight of stairs (Figure 106).

**Figure 106. Vectorscope with Settings to be Adjusted**



# Gamma Correction

Gamma refers to the response curve of video cameras/CRTs. When you capture video with a camera, the camera response remains deliberately nonlinear – it boosts low lumen values and compresses high lumen values – based on two reasons:

- It increases the effective bandwidth in low lumen ranges, where you need it, at the expense of high lumen ranges, where you need it less.
- It matches the response characteristics of TV sets and monitors.

The calibration specified in video standards matches the requirements of cameras and TV sets in broadcast use. This calibration usually, however, does not match the needs of computer-based applications or the response curves of computer monitors. Therefore, you often need a correction inverse to the original bias and you may want to tune for the characteristics of a particular monitor.

**To enable gamma correction:**

1. Click **Enable**.
2. When the setting equals 1.00, you make the response characteristics and the bandwidth identical to the original picture.
    - *Gamma correction applies to all filters and all output pins on each device.*
    - *You can have different gamma corrections for different physical devices.*
    - *When you enable gamma correction, the text box and graphic show the factor applied.*

**To disable gamma correction:**

1. Set the gamma correction value to exactly 1.00.

    *Note: The software-based gamma filter works in pass-through mode with no effect on the video and no processing bandwidth use.*
2. Clear the **Gamma** check box.
    - *Gamma correction applies to all filters and all output pins on each device.*
    - *You can have different gamma corrections for different physical devices.*

If you run preview video while adjusting the filter, you see your adjustment effects interactively. You can use one of three methods to adjust the gamma correction value:

- *Directly enter text in the numeric text box.*
- *Click [+] and [-].*
- *Click on the appropriate signal from the drop-down list in the **Signal** field (NTSC, PAL, or SECAM).*

Gamma correction applies to all filters and output pins on each device. The gamma correction can be different for different physical devices.

*Note: These values represent the inverses of the gamma bias that you applied at the video source per the video standard so the resulting video becomes gamma-neutral.*

# Appendix A: An Introduction to Streaming Media

A live video stream refers to sending online video and audio signals real time to any number of viewers. No matter what the live content is – sporting events, local interest stories, government-mandated open meetings, specialized business opportunities, or training sessions – there is a local or global audience for it. With streaming technology, viewers can watch and listen to media while it is transmitting to their browser, instead of waiting for it to download completely and then play it.

Harnessing the power of streaming technology can take your business to the highest levels. First, you need to understand why streaming media is a compelling way to capture your audience and the technologies behind it.

## Streaming media types

Streamed content can be in a variety of types - news and entertainment being perhaps the most familiar. However, it can also be educational media, as in Distance Learning. For a large enterprise, the video may be a corporate CEO presentation to global employees. For governments, it may be streaming a city council meeting. Internet Radio is streaming without video. Ministries use streaming media to reach out to home-based viewers. In addition, many of less well-known applications exist for video streaming, including traffic cameras and surveillance in high-crime areas.

A number of applications use the streaming technology. When video, or a combination of video and graphics, is delivered over the Internet for a defined and somewhat closed audience, it is often called webcasting. These tend to be live events; viewers watch the event from start to finish as it is happening. When streamed content is delivered as continuous news, sports or entertainment to Internet-connected viewers, it is often called Internet TV. Those tend to be channels, rather than events (viewers can tune in anytime), much like a broadcast television channel.

Another variant, IPTV, is associated generally with delivering premium movie content to viewers on demand, usually to home televisions. This type tends to be one-to-one streams from a stored media library to individual viewers.

# Main workflow processes

Media files can be quite large. For example, five minutes of uncompressed video requires almost one Gigabyte of space. To prepare audio and video for streaming, you need to compress the media to make the file size smaller. When a viewer requests the file, the video server sends a compressed file in a steady stream. A streaming media player (such as the free Windows Media Player) on the viewer's computer or mobile device decompresses the file to play automatically in real time. The viewer can jump to any location in the video or audio presentation. Streaming media generally tries keep pace with the viewer's connection speed to reduce interruptions and stalling. Regardless of the final use of the video, this process can be divided into three main workflow processes.

| Process | Description |
|---|---|
| Single video/session capture (one-off file capture for non-real time delivery) | • Typically allow you to process and/or author the captured file into its final form for delivery. |
| Batch video/session capture (archiving, scheduling and storage) | • Multiple source content to digitalize.<br>• Requires a scheduler to automate capture sessions |
| Live video capture, processing, and delivery | • Can be single or multiple sources.<br>• Live event at a specific time.<br>• Can be a remote or local capture.<br>• Final content delivery in real time to viewers. |

ViewCast Osprey cards have application in all three categories. With Osprey cards, you can pull video directly into your computer to broadcast live, or to create a streaming media file directly from your video camera.

ViewCast Niagara series encoders are designed primarily for the third category - live video capture, processing and delivery. The Niagara streaming appliances have been designed from the ground up to provide a highly reliable, preconfigured, plug-and-play solution that enables users to quickly and easily transform and deliver premium quality standard- or high-definition video to IP and mobile networks.

# What video streaming can do for you

- Broadband Internet makes possible a massive new audience that broadcasters, news services and other multimedia content providers can reach.
- The audience is already poised to receive voice, data and video content on their cell phones, PDAs, and notebook computers.
- Mass media via the Internet is a new source of advertising revenue.
- ViewCast empowers you to stream your content successfully to the perfect audience.
- Streaming powerfully influences your key audience's buying decisions.
- Streaming is extremely cost-effective.
- Streaming greatly appeals to the Internet-savvy generation.

All of these applications essentially use the same technologies to create, process, manage, and deliver live video via a network. All require the live media be captured continuously, frame-by-frame, and made into a digital form in real time for real-time streaming delivery.

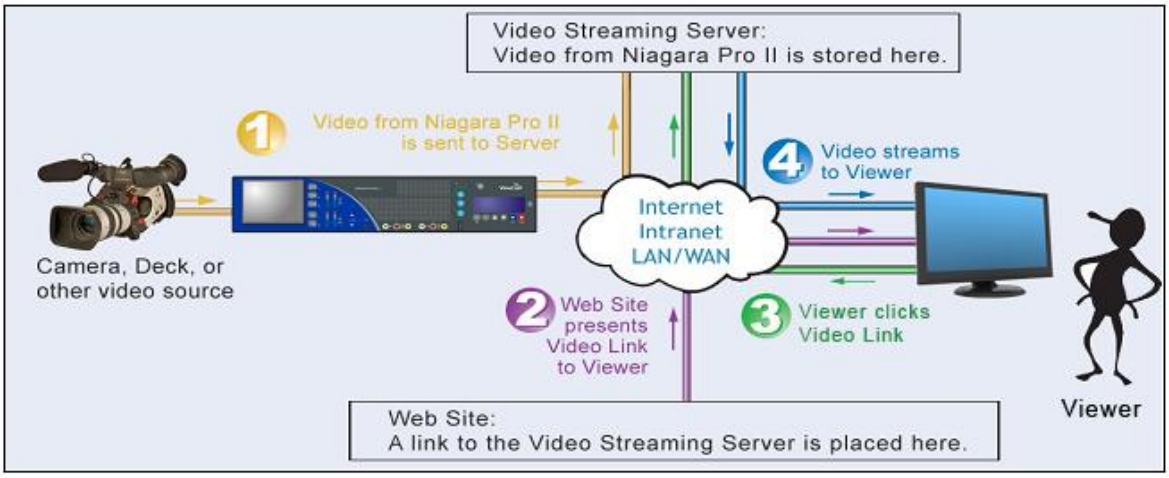
Before you can design a suitable solution, you need to understand a little about the equipment needed to accept live video at its source and deliver it where you want.

TV-quality video contains a large amount of brightness and color information as well as picture detail … too much to go down a small IP pipe like the Internet. It needs to be converted to a form suitable for the Internet or a private network delivery. The technical terms for this conversion are scaling and compression, which together reduce the amount of network resources needed to convey a reasonable facsimile of the original picture and sound.

The conversion process is the careful balance of several factors, including acceptable video quality, available network bandwidth, desired playback picture size, and playback device capabilities. The device doing the compressing is the encoder, and in the figure below, is one of our ViewCast Niagara models - the Niagara Pro II. The encoder accepts live video and audio and compresses them into a stream of data, delivered continuously by the encoder’s TCP/IP network port.

Figure 107 details the entire streaming video path starting with a live video source, like a camera or video player, all the way through to the viewer.

**Figure 107. Video Streaming Example**



# Video compression

TV-quality video contains a huge amount of brightness information, color information and picture detail… much too much to cram down a small IP pipe like the Internet. Therefore, it needs to be converted to a form suitable for Internet or private network delivery. The technical terms for this conversion are scaling and compression, which together reduce the amount of network resources needed to convey a reasonable facsimile of the original picture and sound.

**The Encoder and its Codecs**

The little piece of wizardry inside the encoder that is doing the compression is a Codec, which is a short form of "COder-DECoder." A little misnamed, since all we want to look at right now is the Coder part. All compression codecs invite you to specify the aforementioned factors of speed, size and quality in various ways, but not all codecs equal. There has been considerable evolution in codec technology that improves picture quality for a given network quality and picture size. In addition, there are popular codecs and less popular codecs, each promoted by their creators for picture quality, suitability to an application, compatibility with specific viewing devices, or to be compatible with different international standards.

You may recognize some of these codecs by name: Microsoft Windows Media®, MPEG 2, MPEG 4, H.264, Adobe® Flash® and Adobe Flash Live, the video parts of Microsoft Silverlight™, 3GPP for mobile phones, etc. You have probably encountered all of these as you watch video on the Internet. Which means, unless you have a specific application for streaming video (which usually means an application to a closed audience where you can define what encoded format and what the playback experience will be), you will need an encoder that can handle all of the popular codecs, in any combination, often at the same time. Better yet, you need an encoder that makes it easy to control any or all via a single, common, easy-to-understand user experience.

# The streaming server

The encoder creates the desired video and audio stream. The next steps take care of making the stream available in volume for the anticipated size of the audience, and giving the user some way to start the playback experience. The device that accepts the stream from the encoder (the Uplink Stream) and makes it available to a mass audience is a streaming server.

The server runs special software that accepts uplink streams from an encoder and manages connection requests from hundreds or thousands of viewers. The software these servers run come from a variety of sources, including Microsoft Windows Media Server and many others. Most can stream several different formats. The server can be a single Server if the audience size is small, like a couple hundred viewers or so. This is often the case in Enterprise and Education applications; in these small environments, you may wish to own your own media server and manage its operations. However, if your application requires a more global audience, the server in reality will be a server farm, which is an array of interconnected servers that are often deployed in numbers around the globe.

There are companies, such as Akamai and LimeLight, who own and maintain vast networks of such servers and make them available to you for a fee. These companies call their server array a Content Delivery Network (CDN). The term has over time come to represent the service itself -

you “hire” a CDN to deliver your content. Some CDN companies have online account signup so you can create an instant relationship and be streaming globally in mere minutes.

# How viewers find the stream

So far, you are capturing and encoding live video and audio and creating a TCP/IP stream. You have signed up a CDN, and now you want your audience to view it.

So, what’s next? You will need some way for your audience to know how, and where, to pick up your stream for viewing.

Here’s how that typically works: when you sign up with a streaming service provider (CDN), they will give you both a network address to send your Uplink video to (their server network’s input point), and a link to the server output. The Output URL is important because it is where you want your viewer to browse. For browser-based users the publish link is usually contained in a website link (Step 2); clicking on the link (Step 3) launches an appropriate video player (if one is installed on the viewer’s computer) and the playback experience begins. For mobile devices and most TV-based playback applications, the link is contained in some sort of electronic program guide. The guide can be searchable and even schedule-able. When the link is selected, a suitable player is launched and the video appears on-screen. You can also send the links in e-mails or include them in electronic newsletters. The reader then simply clicks the link to watch the video on their computer or mobile device.

# Are we on the air?

Almost. Once your viewers have an active URL, clicking on it will usually launch a compatible video player. But, as we noted earlier, not every playback device can play every type of video stream. Most players will invite the user to allow automatic installation of the components needed to view the stream type, but not always. To ensure that anyone can view your stream, you may want to stream in more than one format at the same time. Niagara streaming encoders from ViewCast include everything you need to stream in multiple formats, simultaneously. In practice, each different stream from the Encoder would be fed to the Server or server array, and multiple URLs (one for each stream type) would be offered to the viewer. Then the viewer need only click on his or her preference to receive the proper stream.

# Simple guide to streaming audio and video types

As noted above, the encoder can create several different types of audio and video streams. Although all are a type of IP video format, each has certain properties that make it more attuned to a specific streaming video application.

The following chart lists all formats available on ViewCast Niagara encoders. All of these formats can be used for many different applications.

**IP Video Compression for Streaming in Full & Lower Resolutions**

| | |
|---|---|
| Windows Media® | Streaming Internet video and mobile devices |
| Windows Media VC-1 | High-quality Internet video and video to set-top players |
| Adaptive | Streaming Internet video and mobile devices |
| MPEG-4 | Handheld devices and mobile phones |
| Adobe® Flash Live | For VOD playback to selected media players that support Flash encoding format, including the popular QuickTime and VLC players |
| Microsoft AVI | Uncompressed video for later post-processing |

To determine the data rate you will stream your content, you will need to determine the IP bandwidth to which your audience has access.

For example, if the access method uses an ISDN connection or less, then you would stream your video and/or audio at a low data rate such as QCIF at 56kbps. If the access is much greater like a cable modem or DSL connection, then you can provide a higher quality stream at full resolution at 2 Mbps. All Niagara encoders provide preconfigured encoding profiles for different bandwidth connections. The profiles loaded will depend upon how you configure your Niagara encoder on its initial startup.

# Appendix B: Terms and Acronyms

The following terms apply to related information contained in this publication.

| Term | Acronym | Definition |
|---|---|---|
| **Audio-Video Interleaved** | AVI | • Format for digital video and audio under Windows.<br>• The .AVI file format is cross-platform compatible and it allows you to play AVI files under Windows and other operating systems. |
| **Common Intermediate Format** | CIF | • A standard video format used in video conferencing.<br>• Define CIF formats by their resolution, and standards both above and below the original resolution established.<br>• The original CIF is also known as Full CIF (FCIF).<br>• A frame size of 352 x 288 (width x width in pixels) for PAL (European Standard).<br>• A frame size of 320 x 240 (width x width in pixels) for NTSC (U.S. standard). |
| **Data rate** | | The number of kilobits per second required to replay the compressed video at the intended frame rate and quality. |
| **Deblocking Filter** | Deblock | • Optional block edge filter within the coding loop.<br>• Reduces the appearance of block like artifacts that appear in highly compressed video streams.<br>• Use during capture for real-time processing.<br>• Use during conversion or playback to enhance existing media files. |
| **Delay buffer** | | A memory storage area to accumulate video data for the compressor and ensure adequate data availability. |
| **Digital Rights Management** | DRM | • Hardware manufacturers, publishers, and copyright holders use DRM as an access control technology to limit use of digital media or devices.<br>• DRM allows the media or file issuers to control in detail what others can and cannot do with a single instance. |
| **Distributed Component Object Model** | DCOM | A proprietary Microsoft technology for communication among software components distributed across network computers. |

| Term | Acronym | Definition |
|---|---|---|
| **Dynamic Host Configuration Protocol** | DHCP | • A protocol network devices (clients) use to obtain the parameters necessary for operation in an Internet protocol (IP) network.<br>• It reduces system administration workload by allowing users to add devices to the network with little or no manual configuration. |
| **Encoder** | | • A hardware device or software that changes a signal (such as a bitstream) or data into a code.<br>• The code may perform such actions as compressing information for:<br>— Transmission or storage<br>— Encrypting or adding redundancies to the input code<br>— Translating from one code to another<br>• Examples include:<br>— Compressing audio/video into a smaller form<br>— Multiplexing to combine inputs into one output<br>— Functioning as a rotary encoder to convert rotary position to an analog electronic signal<br>— Functioning as a linear encoder to convert linear positions to electronic signals |
| **Flash** | | • Also known as Adobe Flash.<br>• A set of multimedia software originally created by Macromedia and currently developed and distributed by Adobe Systems.<br>• Since its introduction in 1996, Flash has become a popular method for adding animation and interactivity to web pages<br>• Developers commonly use Flash to create animation, advertisements, and various web page components, to integrate video into web pages, and more recently, to develop rich Internet applications. |
| **Frame rate** | | The number of video frames processed per unit of time, usually frames per second. |
| **Frame size** | | The pixel width and height of video image. |
| **Key frame** | | A full frame of compressed video that the decoder uses as a reference frame of video for subsequent delta frames. |

| Term | Acronym | Definition |
|---|---|---|
| **Lossy Compression** | | • An encoding or compression method that eliminates redundant and unnecessary data in a file to compress it more tightly.<br>• It occurs to data that you compress and then decompress to retrieve data that may be different from its original but still close enough to use. |
| **Media Access Control Address** | MAC | • A hardware address that uniquely identifies each node of a network.<br>• In IEEE 802 networks, it interfaces directly with the network medium.<br>• In OSI Reference model networks, its designation is Data Link Control (DLC) address. |
| **Moving Picture Experts Group – 4** | MPEG-4 | • Defines how you transmit multimedia streams – video, audio, text, and data – as individual objects.<br>• A compression/decompression technology that strives to achieve interactivity, efficiency, and stability in narrow-band transmissions.<br>• Aims to pave the way toward a uniform, high-quality encoding/decoding standard to replace the many proprietary streaming technologies used on the Internet today. |
| **Multicast** | | • Applies when sending a piece of information from one or more points to a set of other points.<br>• Multicasting, a networking technique, delivers the same packet simultaneously to a group of clients. |
| **National Television System Committee** | NTSC | • The analog television system used in the United States, Canada, Japan, Mexico, the Philippines, South Korea, Taiwan, and some other countries.<br>• It also refers to the name of the U.S. standardization body that adopted it. |
| **Network Interface Card** | NIC | • A card (hardware) that connects to a wire-based network such as token ring or Ethernet.<br>• It allows computers to communicate over a computer network. |

| Term | Acronym | Definition |
|---|---|---|
| **Niagara Systems** | | • ViewCast Niagara® streaming media systems deliver the quality, features and ease-of-use convenience that professional broadcasters demand.<br>• These pre-configured, plug-and-play solutions enable users to quickly capture and broadcast premium quality audio and video in multiple formats and at multiple bit rates – all simultaneously. |
| **Niagara SCX** | | • A streaming media management software that installs on a user-encoding device connected with remote SCX Explorer workstations.<br>• It too allows users to manage live video broadcasting over the Internet and to mobile devices from their remote workstations<br>• It coordinates the streaming processes to allow users to set up and control Niagara® streaming systems positioned throughout their enterprise or anywhere in the world - all from their desktops.<br>• It functions as one part of the total encoding solution to allow users ultimately to control and monitor each individual stream. |
| **Niagara SCX Explorer** | | • A streaming media management software that installs on any user client device.<br>• It lets users manage live video broadcasting over the Internet and to mobile devices.<br>• It lets users set up and control Niagara® streaming systems positioned throughout their enterprise or anywhere in the world - all from their desktops that interface to the server.<br>• Users can instantly see:<br>— The status of all of their networked encoders<br>— Which encoders have active encode sessions<br>• Allows users to navigate through the application to control and monitor each individual stream.<br>• It can interface with the SCX Explorer Manager to become part of the total encoding operation. |
| **Phase Alternation Line** | PAL | • The standard television broadcast/reception protocol used in Europe.<br>• PAL scans the video image 625 times horizontally. |
| **Pixel** | | Digital images are composed of an array of individual dots called picture elements or pixels. |

| Term | Acronym | Definition |
|---|---|---|
| **Real-time video** | | Video from a video source, such as a camera, that the compressor then processes immediately and sends for decompression and playback. |
| **Sequential Color with Memory** | SECAM | An analog color television system first used in France (in French it translates to *Séquentiel couleur à mémoire)*. |
| **Unicast** | | ● Unicast communication applies to a piece of information that users send from one point to another point.<br>● Unicast transmission refers to users sending a packet from a single source to a specified destination. |
| **Video-on-demand** | VOD | ● Video stored in a file for playing later.<br>● Also, known as Compress Once and Play Many Times. |

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